Participatory Workshop for the Economic Valuation of Natural Resources in the Togean Islands, Central Sulawesi 23 September 1998

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NRM/EPIQ through collaborative effort with
Conservation International
(Jim Cannon, Manager, Resources Economics Program)

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APPENDICES

GLOSSARY

AMDAL	Analisis Mengenai Dampak Lingkungan (Analysis of Environmental Impacts)
BAPPEDA	Badan Perencanaan Pembangunan Daerah (Regional Development Planning Agency)
BAPPENAS	Badan Perencanaan Pembangunan Nasional (National Development Planning Agency)
BKSDA	Balai Konservasi Sumber Daya Alam
CI	Conservation International
CI-IP	Conservation International - Indonesia Program
DFID	Department for International Development (United Kingdom)
JET	(Togeans Eco-tourism Network (TEN))
HK	Hutan Konversi (Forest zoned for conversion)
KT	Konsorsium Togeans (Togeans Consortium formed between CI and YABSHI)
NPV	Net Present Value[1]
NRM	Natural Resources Management Program
PHPA	Direktorat Jenderal Perlindungan Hutan dan Pelestarian Alam (Directorate-General of Forest Protection and Nature Conservation)
SKT	Sekber Konsorsium Togean (Bureau of the Togeans Consortium, based in Palu)
TEN	Togeans Eco-tourism Network (or JET in Indonesian Language)

[1] Net Present Value (NPV) is a standard cost-benefit-analysis measure of the economic value of a specific project or development option. The first step in calculating the NPV is to determine the profits or losses (net cash flow: revenues – costs) made in each year of the project. The next step is called "discounting", and involves reducing the size of profits or losses in the future relative to current profits or losses. This is done to reflect the fact that people value receiving Rp.10,000 immediately more highly than they value receiving Rp.10,000 in a year or two. The NPV is obtained by simply adding up the discounted net cash flow over the lifetime of the project. The choice of discount rate (i.e., how fast future profits or losses are reduced relative to current profits or losses) varies but social discount rates used in economic cost-benefit-analyses of development projects range between 5 and 10%. Private discount rates used in analyses of commercial projects can be considerably higher and commercial bank interest rates are often used as a guide. High discount rates favor projects with immediate benefits and future costs (e.g., logging) while low discount rates favor those with immediate costs and future benefits (e.g., major infrastructure development).

USAID	United States Agency for International Development
YABSHI	Yayasan Bina Sains Hayati Indonesia

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1. INTRODUCTION

This report describes a participatory workshop for the economic valuation of natural resources in the Togean Islands in Central Sulawesi. The economic valuation of natural resources resulted from several trips to area in 1998 and review of data and reports collected from stakeholders and responsible natural resources management agencies. The workshop was used to report preliminary results and refine them through participation and feedback from stakeholders. Economic valuation assists development and land-use planning by identifying the most economically attractive of the competing development options. The Introduction gives a short description of the Togean Islands and the competing development options before outlining the concept and context of participatory economic valuation and the structure of the Palu workshop. Section 2 provides details of the valuation work done at the workshop, while Section 3 discusses the recommendations of the workshop for development plans for the Togean Islands and future valuation work. Conclusions and a brief description of how further economic valuation might be applied in the Togeans are provided in Section 4.

1.1 The Togean Islands: Development Choices and Tradeoffs

The Togean Islands are located in the Tomini bay of the island of Sulawesi in Indonesia. The Togeans are made up of seven main islands and a number of smaller ones with a land area of approximately 700 km^2, approximately 60% of which is forested (Surjadi and Supriatna, 1998). There are no particularly strong tides or currents around the Togeans and four major reef types (patch, fringing, barrier and atoll) support the high marine biodiversity (Mastaller, 1992). There are small but good white coral sand beaches and mangrove forests in several locations.

The Togean Islands were first suggested as a priority for protection in 1984. An area of 100,000 hectares around the main islands of Talatakoh, Togean, Batudaka, Malenge, Taupan was formerly proposed by the Governor of Central Sulawesi as a *Taman Wisata Laut* in 1989 (Mastaller, 1992). These steps were taken in recognition of the importance of the terrestrial and marine biodiversity of the Togean Islands. Terrestrial biodiversity includes a wide range of species only found in Sulawesi or the Togeans themselves, including the Togean macaque, lizard and tarsier (Surjadi and Supriatna, 1998). The giant coconut crab, endangered throughout most of its range in Indonesia, is relatively abundant in the Togeans (Surjadi and Supriatna, 1998). The marine biodiversity includes endangered migrant species such as the dugong, and hawksbill and green sea turtles (Surjadi and Supriatna, 1998). Based on the preliminary findings of CI's Marine Rapid Assessment Program (Marine RAP) in September 1998, the marine biodiversity also includes as many as six new fish species and fifteen reef corals. It is anticipated that several of these species new to science may prove to be found only in the Togeans.

The Togean Islands are predominantly limestone (coral reef origin) and are highly porous (Mastaller, 1992). The groundwater table is reportedly well below the surface and freshwater is generally absent from all but the largest few islands (Mastaller, 1992). There is a dry season of 3 to 6 months, and during long dry seasons, many village wells dry up. During May 1998 one of the wells used by Malenge village was dry, while villagers from Katupat had to

queue late into the night at their well to get sufficient fresh water. Malenge villagers attributed the water shortage in part to fires in March 1998 which destroyed ~50% of the island's forest.

There is a strong demand for better drinking water and a steady supply, particularly during the dry season. Mastaller (1992) noted that "in many of the visited coastal villages drinking water sources are quite distant (- more than one hour of daily paddling)." Mastaller (1992) recommended improving water storage facilities and the capability to transport water between the islands. These may be the only options to improve water supply on the Togeans, where drilling wells for water may not be an option because the fresh water may only be found in a "lens" floating above salt water. In addition to the importance of freshwater for the Togean Islanders, a good supply of fresh water is also required to support the tourism sector.

There is a wide variation in livelihoods between villages, in part reflecting ethnic groups. Although there are fishers, farmers and traders within each village and most ethnic groups, the majority of the Bajo are fishermen, the Togeans are mainly farmers and others (Chinese, Poso, Gorontalo and Bugis) are principally traders (Purnomo, 1992).

The most common traditional fishing method is hook and line, where hand lines with baited hooks are operated from small outrigger canoes (Mastaller, 1992). Other fishing methods include long-line fishing for sharks (for the fins and oil from liver extracts), net, trap and blast fishing. Since 1991/1992 a large live fish fishery has become established. This fishery supplies live fish mainly to the Hong Kong market, with Togean fishers selling their catch to fish traders based in the Togeans who then sell on to live fish export boats which visit the islands regularly. The main method used to capture live fish is cyanide fishing, where divers squirt target species with cyanide solution to stun them so they are easily captured. Fishers and their families consume fresh fish; sun-dried and salted fish are sold within the Togeans; and high quality dried fish and live fish are exported. Other harvested marine resources include sea cucumbers, mollusks and shells, collected for export. Bait fishing to serve the offshore tuna fisheries was reported as an important commercial fishing activity by Mastaller in 1992, although such fishing was largely confined to Talodoka Island and south of Malenge. There is little management of the reef- based fisheries, as noted by Mastaller (1992): "apparently few if any self-imposed fishing restrictions, fishing rights (i.e. limited entry), closed seasons, taboo species, closed areas or restrictions of gear are still observed". Government recorded fisheries data principally describe the pelagic fisheries of Tomini Bay and do not report the origin of the landings. Little quantitative information exists on the reef fisheries.

There has not been a thorough assessment of agriculture in the Togean Islands, though coconut is of major importance, as are a number of other crops (i.e., cocoa, cloves, sago, cassava, banana, sugar cane, sugar palm, papaya, chili peppers). The recent favorable economic conditions for cocoa production have resulted in higher rates of forest conversion to cocoa plantations.

Tourism has become economically important in the Togeans only since the early 1990s. Before that the main livelihoods in the Togeans were fishing, farming and trading. The growth in tourism in the Togean Islands since the early 1990s has been dramatic. In 1991 there were less

than 100 tourists, with the majority being categorized as “explorers” or “backpackers” (Cochrane, 1992). In 1995/96 over 3.500 tourists visited the Togeans and the number of tourist beds jumped from 66 in 1995 to 150 in 1996 (Ary Suhandi, pers. com.). As tourism has expanded, the proportion of tourists made up of higher spending dive tourists has increased, and the first US$100 / night dive resort opened on the Togeans in 1998. Tourism – particularly the higher value dive tourism – depends entirely on conserving the marine and terrestrial biodiversity assets of the Togeans.

However, damage to the environment will not only impact tourism revenues, but could jeopardize traditional fisheries, agriculture and human health. The main threats to the environment are:

- commercial logging
- conversion of forests for agriculture
- catastrophic fires
- over harvesting of non-timber forest products, including hunting
- over harvesting of mangroves
- destructive fishing methods (bombing and cyanide)
- coral mining for construction and lime production
- coastal erosion
- inappropriate tourism infrastructure development and over use of the reefs

Some of these threats may be exacerbated by economic development proposals under consideration in 1998. Commercial logging damages forests and reduces terrestrial biodiversity and the supply of non-timber forest products. Logging activities, in particular logging roads and log yards, also increase erosion rates and subsequent sedimentation on coral reefs. Sedimentation on reefs smothers the corals, killing them and resulting in a reduction in living coral cover. Reductions in live coral cover reduce fish populations and fish catches and lower the value of the reefs for tourism. Conversion of the forests for agricultural has similar impacts. The lack of strong currents and tides around the Togeans exacerbates the risk of sedimentation impacts on coral reefs resulting from the loss or degradation of forests.

Both logging and agricultural conversion can lower water tables, particularly in small watershed such as found in the Togeans. This is because a greater portion of rainwater immediately runs off deforested slopes, rather than filtering through the soil into the water table. In addition to the human health risks associated with reduced water supply, less water would restrict the volume of tourists the Togeans can support. Reduced water supply, together with the drier climate in logged forests and agricultural land, increases the risk of catastrophic fires – as occurred in March 1998. Fire is a severe risk in the Togeans, where a single fire can destroy all forest habitats and agricultural crops on a small island.

The reduced water supply seen in early 1998 also affected the Togeans wildlife. In dry periods macaques and wild pigs feed in agricultural land more frequently and do more damage. In order to protect their coconut groves and livelihoods, Malenge villagers reported that they might have to start killing the macaques.

The coastal mangrove forests provide numerous environmental "goods and services". They help prevent sediments from upstream reaching the reefs, they are a nutrient source for the marine ecosystems, they provide shelter and nursery grounds for juvenile fish, they are a tourist attraction, and they can be harvested sustainably by local communities for fuel-wood and medicines. However, mangrove forest areas are shrinking in the Togeans (due to unsustainable fuel-wood harvesting and encroachment from coconut planting) and there is no systematic replanting taking place.

Destructive fishing methods such as cyanide and blast fishing can generate large private benefits to a select few fishers, but these benefits are short-lived. The target species are rapidly over-fished and catches fall within a few years. Certain target species, such as Napoleon wrasse, may even face local extinction. The cyanide kills living coral while blast fishing kills the living coral and breaks up the dead coral. While blast fishing with explosives has a long history in the Togeans, cyanide fishing is a relatively recent phenomenon, appearing only in 1991/92. However, the impacts of cyanide fishing are already clear, with widespread damage to the reefs and a significant decline in the abundance and catches of the most popular species. The depletion or extinction of certain species can unbalance the coral reef ecosystem with potentially serious results. For instance, the *Napoleon wrasse* eats Crown of Thorn starfish and it is believed that reducing the number of *wrasse* can be a factor behind Crown of Thorn outbreaks that significantly damage reefs. Damage to the coral reefs reduces the productivity of traditional fisheries and the value of the tourism attraction. Hence, destructive fishing results in short term benefits for few people while resulting in long term costs for many.

Coral is mined for construction (particularly house and dock foundations) and to make lime for mortar. This practice destroys reefs, which – in addition to the immediate impacts on traditional fisheries and tourism - rapidly diminishes the coastal erosion protection provided by healthy reefs. Elsewhere in Indonesia, the removal of reefs due to coral mining has resulted in increased erosion and loss of coconut groves and beaches – with predictably negative effects on tourism.

The tourism industry may itself represent a threat if not carefully managed. Inappropriate tourism infrastructure development (e.g., poor sewage treatment, use of coral in construction, use of mangrove wood for fuel, anchor damage to reefs) and too many visitors can damage the environment the tourists are coming to see. In the long-term such tourism would be unsustainable. Even if tourism development is carefully managed and low impact it may still prove unsustainable if the impacts identified above continue unabated.

While the environmental impacts of all these economic activities can be mitigated or reduced to some extent, certain of the activities are likely to have a significant impact on the environment despite these efforts. Such activities include commercial logging, oil palm and rubber estate crops, expansion of small holder agriculture, destructive fishing, and coral mining. Fuel-wood collection has had major impacts on the mangroves in the Togeans but it may be possible to harvest fuel-wood sustainably. Other economic activities, such as traditional fishing and tourism, have not caused significant impacts to date. While they can both have impacts on the environment and biodiversity, effective management may be able to prevent such impacts.

Furthermore, there is a potentially strong incentive for effective management as both fishing and tourism are dependent on the conservation of biodiversity. While pearl farming is not strongly dependent on biodiversity, high quality water is essential. No significant environmental impacts arising from pearl farming have been detected, although the farms have had social impacts by reducing access to fishing grounds and navigation routes. Table 1 provides a summary of the main economic activities in the Togean Islands, their dependence on biodiversity and their impact on the environment.

The trade-off and interactions between different economic activities can also be seen from Table 1. The clearing and degradation of forests is likely to increase sedimentation on coral reefs and the sea, in turn reducing benefits from fisheries, tourism and pearl farming. Water supply in the Togeans is limited, and any changes in hydrology due to land use change could have significant economic impacts. Several communities live on islands with no fresh water supply and many more are dependent on a single spring source. Destructive fishing directly damages coral reefs, reducing the future productivity of destructive fishing itself, as well as traditional fisheries and tourism.

Table 1 – A SUMMARY OF THE MAIN ECONOMIC ACTIVITIES IN THE TOGEAN ISLANDS, THEIR DEPENDENCE ON BIODIVERSITY AND THEIR IMPACT ON THE ENVIRONMENT.

Activity	Dependent on biodiversity - (No)	Impact on the environment + (Yes)	Comments
Commercial logging	-	+	These activities impact terrestrial biodiversity, hydrological functions, and coral reefs by increasing sedimentation. Social impact due to changes in water supply and land ownership.
Oil palm/rubber	-	+	
Small holder conversion	?	+	
Traditional fishing	+	(+)	Potential over-harvesting.
Cyanide/blast fishing	+	+	Long term destruction of coral reefs, reducing marine productivity. Over-harvesting of target species.
Coral mining	-	+	
Fuelwood collection	-	+?	Impacts terrestrial biodiversity, particularly mangroves, with resulting marine impacts.
Tourism	+	(+)	Potential impacts due to infrastructure development and over-visitation, social impacts.
Pearl farming	-	?	Pearl farming is dependent on high quality water.

While these trade-offs are acknowledged by Indonesian decision-makers, they have rarely been quantified. Decision-makers are more familiar with financial analyses of development activities, which describe the private costs and benefits that accrue to investors or others directly involved in the development activity. Such analyses may supply decision-makers and stake-holders with misleading information because they fail to take into account the full range of costs and benefits associated with the activity – the trade-offs described above. Financial analyses are based on traded goods and services (e.g., trucks bought, logs sold) and do not include essential environmental and social factors which are not traded and have no market price (e.g., water supply, soil and biodiversity conservation). Financial analyses also often exclude the costs of impacts which occur "off-site" (e.g., downstream), even though these impacts may result in obvious market-based costs to other people. The exclusion of such costs and benefits is not surprising, because the aim of financial analysis is to describe the private costs and benefits that accrue to investors or others directly involved in the development activity.

Economic valuation is quite different, in that it seeks to include all costs and benefits in the analysis and determine the net benefits to society, rather than a few individuals or groups of project proponents. The aim of economic valuation is to quantify the trade-offs between competing and interacting development options and resource uses and determine the true economic – rather than financial – performance of development activities, taking account of all costs and benefits, both public and private, both on-site and off-site. Thus economic valuation can assist in identifying which of these competing and interacting development activities and land-uses produce the highest benefits for the Togean communities and Indonesia in general.

1.2 Participatory Economic Valuation

Determining the economic value of a development activity can be quite laborious because placing values on non-traded goods and services is often difficult. The participatory economic valuation approach used at the workshop was designed to meet the following requirements:

- provide decision-makers with enough information of adequate quality to guide land use and development decisions
- be suitable for widespread use across Indonesia

In order to achieve the first requirement, decision-makers must view the figures produced as credible. For the figures to be credible it is suggested that the valuation methods used need to:

1. be simple, so they can be understood
2. be based on data perceived as accurate
3. use assumptions perceived to be reasonable

For an economic valuation approach to be used widely across Indonesia, then - in addition to producing credible information - the approach must also be:

4. rapid, so that information can be made available to decision makers when they need it
5. applied by staff of the Indonesian Government and other organizations
6. inexpensive

These requirements mean that the valuation approach should use currently available data as much as possible to reduce the expense of data collection. The data currently available are generally market-based and describe either the production use of natural resources (i.e., fish catching, farming, forest products harvesting) or non-production uses (i.e. tourist visitor numbers and expenditure). Decision-makers may also be more familiar and comfortable with these data than the information that may be collected by the survey based methods required by contingent valuation and other more complex valuation techniques. The valuation methods required to use market-based data are considerably more simple than the statistical analyses required to interpret complex survey-based valuation techniques. This simplicity means they can be understood by decision-makers, can be done reasonably quickly, and can be more readily applied by a greater number of staff in Indonesian Government departments and organizations.

Given the above points, it appears that a valuation approach using simple methods to analyze available market-based data may be most suitable. However, the major drawback of such an approach is that it can only capture part of the total economic costs of impacts on the environment. The approach cannot determine bequest or existence values, nor can it determine values if market-based data does not exist. Therefore the figures determined using such an approach represent a minimum lower bound on the actual total economic value.

However, it is often not necessary to carry out a full economic valuation. In many cases a partial economic valuation is often sufficient to guide land use and development decisions. This can be true where products or services based on natural habitats have a high market based value (i.e. eco-tourism, fresh water supply or fisheries) and the profits of the proposed development activity are low. In these cases, the social costs of only a few development activity impacts may be greater than the private profits of the activity. When the social costs are bigger than the private profits, the net benefits to society are negative and the development activity is economically unattractive. Hence it is not necessary to determine the economic value of further environmental impacts because the project can already be rejected on the basis of current information.

In most cases it will not be known in advance whether the market-based natural habitat values that can be determined using currently available data will be greater than the value of proposed development activities. An analysis using currently available data is the first step in an iterative process. If the values based on currently available data are not sufficient, then additional data can be collected and further analyses carried out.

The best currently available information on the costs and benefits of different activities is often held by local decision-makers and stake-holders. A participatory economic valuation approach:

- fully utilizes the data and knowledge of local decision-makers and stake-holders;
- maximizes the involvement and feedback from partners and counterparts to develop and improve the resource valuation analyses and approach;
- raises awareness among all valuation participants of:
  - the need for economic valuation of resource use;
  - the kind of information that valuation can provide;
  - the way in which valuation can be carried out.

Details of the valuation approach used are presented in Appendix 2 (which is a copy of the presentation made at the workshop) and Section 2, where the analyses carried out at the workshop are described in detail.

1.3 The Workshop Agenda and Structure

Following the opening statement by *Kepala Bappeda TK1*, I made a presentation on the concept of economic valuation (see Appendix 2). Following this presentation there were sessions devoted to forestry, fisheries and tourism. These sessions commenced with a short presentation of the available data and the valuation results, followed by questions, comments and suggested changes to the data made by workshop participants. The results of these sessions were then combined to determine the economic case for or against logging in the Togean Islands. This was followed by two further sessions, the first discussing recommendations for development options in the Togeans, and the second discussing further work in the Togeans and ways in which the participatory valuation workshop approach could be improved in general.

2. VALUATION WORK: CALCULATIONS

2.1 Overview

The workshop described in this report contributed to two different programs. The work provides a case study of how economic valuation methods could be used to assist development-planning decisions. The work also represents one element of a series of economic analyses to support natural resources and protected area management in the Togean Islands.

The workshop described in this report took place on the third consultant trip to Indonesia. The first trip was spent assessing the outputs various stakeholders and decision-makers required from economic valuation and identifying sources of data and information relevant to the economic valuation. The first trip also resulted in the development of a work plan to: (1) gather and analyze available information; (2) visit field sites; (3) develop the technical approach and methods to be used; (4) hold a participatory workshop; (5) carry out any required primary research; and (6) complete analyses of the collected data. Steps 1 through 3 were largely achieved during the second trip, although the trip was cut short and Step 4 (the workshop) was postponed due to political factors in Indonesia. The workshop was carried out on the third trip and is described in this report (trip reports are copied in Appendix 5).

The choice of development activities analyzed at the workshop was made on the basis of priorities for communities and decision-makers identified during the second trip, and the quality of the data and information obtained for the different activities. Cyanide fishing and the loss of forest cover due to logging, fire and conversion for agriculture were identified as the development activities which carried the most significant external costs, as described in the introduction. These external costs were identified as loss of fisheries productivity and tourism revenues due to reef destruction, and reduced fresh water supply due to hydrological changes resulting from loss of forest.

The decision to focus on logging at the workshop was taken because reasonable data existed, and the majority of the forests were zoned as limited production forests for logging. An analysis of agricultural conversion by small holders was identified as a necessity, but was planned as a future activity because available information was insufficient and primary research was required. Analyses of conversion for commercial agriculture, such as oil palm, were not carried out because the decision-makers and stakeholders consulted did not consider these to be likely development activities. In part this was because of the additional transport costs associated with commercial production in the Togeans, and the fact that growing conditions were sub-optimal for oil palm because of the pronounced dry season and limited fresh water availability. In addition, legislation passed during 1998 prohibited oil palm on islands smaller than 10 km^2 and slopes greater than 25%. The legislation also required that oil palm be located in forest areas zoned for cultivation in provincial spatial plans and that plantations had to be greater than 10,000 hectares in size. Together these rules were thought to prohibit oil palm development in the Togeans.

Sedimentation onto the coral reefs was the main impact resulting from logging that was considered at the workshop. The costs of such sedimentation were estimated for the tourism and fisheries sectors. Information was presented at the workshop on cyanide fishing and the costs of reducing fresh water supply, although the available information prevented either from being incorporated into the quantitative analyses.

The analyses of the financial performance of forestry, tourism and fisheries are described in Sections 2.2, 2.3 and 2.4 respectively. The environmental impacts associated with forestry are then described in section 2.5 and the costs they cause to tourism and fisheries are estimated. Conclusions, and a discussion of other development activities and their impacts, are given in section 2.6.

2.2 Forestry

2.2.1 Introduction

There are no legal logging concessions on the Togean Islands at the current time. In this section we determine the revenue and profits of a potential logging operation. Our estimates are based on the production figures from an old Togean Islands concession held by PT Gobel from 1975 to 1995, and logging costs and prices from DFID studies and a feasibility study for a concession in Donggala.

2.2.2 Method

Data from PT Gobel logging plans (Anon., 1994) described the area logged and the volume and species composition of the timber extracted for each year from 1980 to 1994 (see Table 1). An average area of 750 ha. was logged each year[2]. The timber from the Togeans was transported to PT. Jati Maluku Timber, part of the Hassan group of companies, to be processed into sawn wood (D. Brown, pers. comm.). The Department for International Development[3] (DFID, of the United Kingdom) carried out a study which determined the price of roundwood sold for sawn wood processing based on a linear log-log regression of data obtained from concession operators across Indonesia (Scotland and Whiteman, 1997). This study also surveyed the logging concessions to analyze operating costs. Both price and cost data from the DFID study are reported in Table 1. Note that the cost data provided describes a concession meeting TPTI regulations, but does not include any levies or taxes. Further information on logging costs, prices and revenues from a feasibility study for a concession in Donggala, Central Sulawesi (Anon., 1998) are also reported in Table 1 (these figures also reflect a concession meeting TPTI requirements).

It may be considered surprising that logging profits per m^3 are so low. These figures are for concessions meeting TPTI regulations and supplying sawnwood mills. Other studies have

[2] 750 ha/year, over a 25 year concession suggests a total concession area of 35,000 ha (with a 35 year rotation period and 25% of the concession area being inoperable). PT Arrow - M. Gobel were actually given a 70,000 ha - considerably larger than the forest area available for logging on the Togean Islands.
[3] DFID was formerly the Overseas Development Administration (ODA)

confirmed that concessions meeting TPTI regulations can be loss making, even if located in forests of greater timber value (e.g. Tomich et. al., 1998, for Sumatra). The estimates of *Profit/m^3* in Table 1 are also made using pre-crismon prices. There is little information on post crismon log prices but they are thought to be considerably lower: participants at the meeting suggested current log prices are around US$ 40. Uncertainty regarding prices is addressed below by preparing Low and High Value Scenarios.

Table 2 – LOGGING DATA

Variable	Data	Units
Based on PT. Arrow - M. Gobel:		
Area logged (average / year)	750	Hectares (ha.)
Volume logged (average / ha.)	30	m^3/ha
Proportion Meranti	33	%
DFID data:		
Meranti price[a] (1996)	70	US$/$m^3$
Non-Meranti price[a] (1996)	60	US$/$m^3$
Average price[b] (1996)	63.3	US$/$m^3$
Unit cost[c] (1996)	59.5	US$/$m^3$
Profit (Loss) / m^3	3.8	US$/$m^3$
Dongalla study:		
Average price (1998)	75	US$/$m^3$
Cost (1998)	71.5	US$/$m^3$
Tax on profits	2.5	%
Profit (Loss) / m^3	3.4	US$/$m^3$

a) From Table 3.3, Scotland and Whiteman, 1997
b) weighted according to harvest composition data from PT Arrow - M. Gobel
c) Recalculated from 43 different budget lines for two scenarios - (i) a concession producing 40,000 m^3/year at 24m^3/ha, and (ii) 40,000 m^3/year at 36 m^3/ha. These two scenarios were averaged to obtain a cost estimate for a concession producing 40,000 m^3/year at 30m^3/ha (as observed in the Togeans).

Addressing uncertainty

In the *Low Value Scenario* we assume that a legal logging concession following TPTI regulations on the Togean Islands will not make any profits in the future.

In the *High Value Scenario* we assume that a concession would make no profits for the next two years. After two years, we assume log prices will recover and that profits of US$ 2.50/m^3 (Rp. 25,000/m^3) will be obtained from the third year onwards. The result for the *High Value Scenario* is shown in Table 2.

2.2.3 Results

Table 3 – HIGH VALUE SCENARIO

Figure	Calculation	Result
Profit / year[a]	= Area logged/year x Volume logged/ha x Profit/m^3 = 750 (ha) x 30 (m^3/ha) x 25.000 (Rp./m^3)	563 million Rp.
NPV	**(over 25 years, 10% discount rates, constant profits)**	**4.113 million Rp.**

[a]) from year 3 onwards

2.2.4 Participatory Input and Conclusions

It was suggested that using the figures presented above implies that logging is unprofitable anywhere in Indonesia. There is considerable variation in the timber value of forests across Indonesia and such a conclusion cannot be reached from the information presented above. Also note that the prices used were for sawn wood, whereas plymill prices are higher, reflecting higher quality logs (Scotland and Whiteman, 1998). However, it is clear that profits from a concession following TPTI regulations are considerably lower than commonly believed.

The common perception of high logging profits may be based on observations of typical logging concessions, most of which may not satisfy TPTI regulations. In the Dongalla study, TPTI required replanting costs that totaled US$10. If a logging company did not carry out replanting the profit increases to US$12.50/$m^3$, generating annual revenues of Rp.2,813 million and an NPV of Rp.20,565 million. The DFID data suggests TPTI related costs of approximately $5.80 for a 40,000 ha concession being harvested at 30 m^3/ha. Using the DFID figures, this would increase profits to US$8.30/$m^3$, generating annual revenues of 1.868 million Rp. and an NPV of Rp.13,655 million. Logging companies therefore have a strong financial incentive to ignore TPTI regulations.

Conclusions:

In the comparison of logging versus multiple-use conservation presented in Section 2.5 below, the High Value Scenario is used as the estimate of logging profits. In contrast, the Low Value Scenario estimates for the other economic activities are used in the comparison. Such an approach favors logging. Therefore, should the value of the impacts of logging on other activities (based on the Low Value Scenario estimates) exceed the profits from logging (based on the High Value Scenario estimate), logging can clearly be rejected as a development activity on economic grounds.

2.3 Tourism

2.3.1 Introduction

In this section the value of tourism is measured as the profits of the tourism industry based on expenditure in the Togeans only. This measure does not include the expenditures made on the way to or from the Togean Islands (i.e. in Palu, Poso or Ampana). While these expenditures do not directly benefit the Togean Islanders, they are a significant source of income for Central Sulawesi. Not all of the tourism income to travel companies and hotels in Central Sulawesi can be attributed to the Togean Islands. Some of these expenditures must be shared with other tourist attractions (e.g. Lore Lindu National Park, and people travelling between Tana Toraja and Bunaken). However, as the Togean Islands become better known they may increasingly become the principal destination for a larger number of tourists and will be responsible for an increasing share of the tourism income across Central Sulawesi.

Estimating tourism value based on direct expenditure also excludes a large proportion of the value tourists actually gain from visiting the Togeans. The total value to tourists, termed "willingness to pay", can be estimated using specialist techniques such as the travel-cost method.

2.3.2 Method

Current *Total Revenue* was determined by multiplying *Per Capita Expenditure* per tourist per day by the *Trip Length* per tourist by the *Total Number* of tourists. Current *Profits* was determined as a percentage of *Total Revenue*. The data used were sourced from material provided by Ary Suhandi (CI-IP Conservation Enterprise Coordinator). His material sourced information from Provincial Government statistics and SKT surveys of Togean Island tourism operators.

Table 4 – TOURISM DATA

Variable	Data	Units
Per capita expenditure	40,000	Rp./day/tourist
Trip length	7	days/tourist
Total Number	3,500	tourist

The data provided above does not include external costs that may result from impacts caused by the tourism industry itself (e.g. through inappropriate hotel design or excessive number of visitors). Cochrane (1992) states that the sustainable tourist level for the Togeans (i.e. no significant impacts) is 32,000 tourist-days per year. This figure represents an expert's opinion, although no supporting evidence is provided. Based on the figures reported above, the tourist

level in the Togeans is currently 24,500 tourist-days per year[4]. The figures provided above describe current tourism expenditure rates. As noted in the Introduction, the majority of current tourists are classified as "back-packers". However, an increasing number of older dive tourists are visiting the Togeans and spending considerably more than the back-packers. This trend has been accelerating, and the first US$ 100 per person per night dive tourist resort recently opened (Walea resort) - expenditure levels not captured in the data presented above in Table 3.

In light of the above information it appeared that the estimate provided in Table 3 represented a *Low Value Scenario*. *Medium* and *High Value Scenarios* were designed assuming 10% and 20% increases in expenditure per tourist every year respectively. Under the *Medium Value Scenario*, expenditure per tourist would rise to Rp.394,000/day by year 25. In the *High Value Scenario* it was assumed that expenditure per tourist per day would rise until a maximum of Rp.600,000/day expenditure was reached in 15 years, where it would then stay constant from years 16 to 25. It should be noted that since 1991 tourist visitation to the Togean Islands has grown approximately 240% (see Introduction). The maximum figure reached in year 15 in the *High Value Scenario* is still lower than the expenditure rates currently seen in Bunaken (NRMP, 1993). The total number of tourist-days was kept constant at 24,500. As noted in the Introduction, the number of tourists visiting the Togeans is increasing rapidly. In this analysis it is assumed the number of visitors is controlled to prevent significant tourism industry impacts.

2.3.3 Results

Table 5 – LOW VALUE SCENARIO

Figure	Calculation	Result
Total Revenue	= Per Capita Expenditure x Trip Length x Number = 40,000 (Rp./day/tourist) x 7 (days) x 3500 (tourists)	980 million Rp.
Profit	= 0.6 x Total Revenue = 0.6 x 980 million Rp.	588 million Rp.
NPV	(over 25 years, 10% discount rate, constant profits)	5.337 million Rp.

[4] During the workshop an error was made in calculating tourism profits. An average length of stay of only 1 day per tourist was used rather than the 7 days currently seen. Increasing the length of stay effectively increases the value of tourism by a factor of seven under each of the scenarios used. The error does not affect the results of the value workshop.

Table 6 – MEDIUM AND HIGH SCENARIOS

Year	Medium Value Scenario Profit (million Rp.)	High Value Scenario Profit (million Rp.)
1	588	588
2	647	706
3	711	847
4	783	1,016
5	861	1,219
6	947	1,463
7	1,042	1,756
8	1,146	2,107
9	1,260	2,528
10	1,386	3,034
11	1,525	3,641
12	1,678	4,369
13	1,845	5,243
14	2,030	6,291
15	2,233	7,549
16	2,456	8,820
17	2,702	8,820
18	2,972	8,820
19	3,269	8,820
20	3,596	8,820
21	3,956	8,820
22	4,351	8,820
23	4,786	8,820
24	5,265	8,820
25	5,792	8,820
NPV[a]	**13,364**	**28,781**

[a]) calculated using a 10% discount rate

2.3.4 Participatory Input and Conclusions

While figures were not suggested, it was expressed that even the High Value Scenario was actually too low. A dive resort on the Togeans is already charging US$ 100 per day per tourist and further such resorts are expected in the near future as the Togeans is increasingly seen by tourism operators as a viable alternative to Bunaken NP.

Conclusions:

The high rate of increase in tourism activity in the Togeans over the past few years may require strengthening of legislation to control visitor numbers and tourism industry development in the near future. While the current political uncertainty in Indonesia is seen as a deterrent to tourists, it is anticipated that the competitive tourism prices in Indonesia will result in a quick recovery as stability returns.

There are two key requirements if tourism is to generate sustainable conservation and development benefits: (1) that tourism development itself does not harm the environment; and (2) that tourism provides an effective incentive for local communities and government to protect the environment. Cochrane (1992) made a number of recommendations to help ensure that tourism provides an incentive for conservation:

- local people must benefit
- local communities must be aware that tourists visit the area to enjoy nature
- local people should participate in planning, managing, marketing and owning tourism facilities and attractions (and be provided with the training to do so)
- initial tourism plans should be realistic and achievable
- the local government should be active participants (and develop appropriate regulations as a basis for controlling development)
- conservation education to strengthen understanding that tourism revenue is there because of nature attractions

Cochrane (1992) suggests that tourism will only be effective in supporting conservation if it generates significant benefits for a sufficient proportion of the local communities. However, in some regions it may be unrealistic to expect tourism alone to provide sufficient incentives and other benefits of conservation may need to be considered.

In the Togeans, SKT has been instrumental in encouraging tourism operators to join together into the Togeans Eco-tourism Network (TEN) and providing them with support to help ensure that the key elements identified above are present. The recent award from British Airways, the successful opening of the mangrove board walk attraction (with good support from local government), and the expansion of TEN are indicators of their success to date. The economic assessments presented above are a first attempt at assessing the incentives required for conservation in the Togeans, and the importance of tourism in delivering those incentives.

2.4 Traditional Fisheries

2.4.1 Introduction

Here we directly estimate the fisheries component of total reef value of the Togeans as the profitability of fisheries production based on market information. The analysis presented below considers only traditional food fisheries using traditional fishing methods. Destructive cyanide fishing for the live fish trade and bomb fishing were excluded because of insufficient data on the revenues, costs, numbers of fishers and size of catches involved. These destructive fishing methods also cause significant impacts on coral reefs and impose large costs on themselves, traditional fisheries and tourism (see valuation conclusions below). Although traditional fishing methods have limited direct impacts on the corals themselves, over-fishing can occur. Over-fishing reduces the long-term catches and profitability of the traditional fisheries, and reduces the abundance of large and rare fish. Lower abundance of large and rare fish may reduce the incentive for dive tourists to visit the Togeans, thus imposing costs on the tourism sector. Determining whether over-fishing has occurred in the Togeans, or may become a problem in the future, requires further research and was not considered in the following analysis.

2.4.2 Method

Total Revenue was determined as the product of *Total Catch* and *Average Price*. *Profit* was determined by subtracting *Total Cost* from *Total Revenue*. Census data provided population numbers and figures for other variables were obtained from interviews with SKT field extension workers. Uncertainty in these data was addressed by introducing a *Low Value Scenario*, as explained further below.

Total Catch

Total Consumption was determined by multiplying *Per Capita Consumption* by the Togeans *Population*. *Total Catch* was then determined by correcting to account for *Percentage Exports*. The data used are shown in Table 1, and supporting information discussed below.

Table 7 – TOTAL CATCH ESTIMATE

Variable	Estimate	Units
Population	29,347	people
Per capita consumption	0.5	kg/day/person
Total consumption	5,355	tons/year
Percentage exported	60	%
Total catch	**13,400**	**tons/year**

Earlier studies in Bunaken NP and the Togeans provide further information on *Per Capita Consumption*. Each year 955 tons of fish are consumed by the 2,555 full-time fishers and their families in Bunaken NP (NRMP, 1996a). This suggests each full-time fisher and their dependents consume 1 kg/day of fish. Wirawan (1992) report that the 1,123 fishermen of Kecamatan Una-Una in the Togeans came from 520 families, suggesting ~ 2 fulltime fishers per "fishing" family. The average size of families is unknown, but seems likely to be higher than 4 persons. It is possible that the *Per Capita Consumption* figure of 0.5 kg/day/person is too high and may represent adult consumption figures while children may eat less.

Further information on *Total Catch* was obtained from Wirawan (1992), who noted that the 1990 Census statistics report that, out of a total population of 16,676 in Kecamatan Una-Una, 1,123 are fishermen and they caught 3,180.5 tons of fish annually. Scaling up to the total *Number of Fishers* (3,609 fulltime, see below) for the Togeans suggests a *Total Catch* of 10.200 tons/year in 1990. However, it is difficult to collect fisheries data and Government statistics are thought to report only part of the fish catches. For instance, the volume of fish represented within official catch figures for Bunaken was estimated between 10 and 50% (NRMP, 1996). Current catches may also be higher because of technological improvements in fishing methods in the Togeans since 1990, with a greater proportion of the fleet now using outboard motors.

The *Total Catch* figure was also checked by determining the *Catch Rate* (kg/fisher/day) and comparing the figure obtained with information from other Indonesian fisheries. In order to determine *Catch Rate*, the annual *Total Catch* is divided by the *Number of Fishers* and the number of fishing days in the *Fishing Season* (see Table 2).

Table 8 – IMPLIED CATCH RATE

Variable	Estimate	Units
Number of fishers (full-time)	3,609	people
Fishing season	240	days/fisher/year
Total catch	13,400	tons/year
Catch Rate	**15.5**	**kg/day**

The 15.5 kg/day *Catch Rate*, obtained using the figures suggested by SKT staff, falls within the range observed by Riopelle (1995), who gave catch rates of 8.3 kg/day (assuming 3 days/fishing trip) or 12.5 kg/day (assuming 2 days/fishing trip) for sailboats and a minimum of 40 kg/day for outboards (the sailboats mainly fished the reef, while outboards took the majority of their catch from pelagic fisheries). In Bunaken, NRMP (1996a) estimated an average catch rate of 20 kg/day for the reef-based fisheries and up to 25 kg/day if the pelagic fisheries were included.

The numbers used in each of the options for calculating *Total Catch* are within the ranges reported for other Indonesian fisheries, and produce consistent estimates. Based on the above information, current annual *Total Catch* was estimated as 13,400 tons/year. The uncertainty in

this estimate is addressed with the adoption of a *Low Value Scenario*, as explained further below.

Average price

Average Price was based on information from SKT staff that fresh fish for consumption in the Togeans fetched Rp.1,750/kg, while salted and dried fish for export earned ~ Rp.6,000 /kg. In order to allow for weight differences between fresh and dried fish, a conversion factor of 0.3 was applied, giving an *Average Price* of Rp.1,800/kg for landed fresh fish. This price figure does not include the higher value *Napoleon wrasse* and groupers sold to the live fish traders for export to Hong Kong (based on my interviews with fishers and live fish traders in May 1998, fishers receive Rp.15,000/kg for *Napoleon wrasse*). Nor do they include the other marine resources that are harvested in addition to fish, such as sea cucumber (or *"teripang"*). Wirawan (1992) reports prices for *"teripang"* between Rp.1,000 and Rp.5,000/kg, depending on the species. Riopelle (1995) reported revenue and catch figures that suggest an average price of Rp.1,340/kg for the coral reef fishery of West Lombok. An average price of Rp.1,300/kg is reported for the Bunaken artisinal fishery (NRMP, 1996a). In Biak (Irian Jaya) fish are sold for an average price of Rp. 1,800/kg, but this figure does not include the most valuable fish (Cesar, 1996). The average Government auction price was Rp.2,200/kg (NRMP, 1996a). Based on the above information the *Average Price* was determined at Rp.2,000/kg[5]. The uncertainty in this estimate is addressed with the adoption of a *Low Value Scenario*, as explained further below.

Total cost

In the coral reef fisheries of West Lombok, costs for sailboats fishing the reef were 68% of revenue (Riopelle, 1995), while in the artisinal fisheries of Bunaken (the majority of which are also non-motorized), costs represented only 25% of revenue (NRMP, 1996a). In both cases costs per fisher (fixed and variable) represented were similar (Rp.6,320/day in West Lombok, and ~Rp.5,000/day in Bunaken) and labor costs amounted to ~33% of total costs in both cases (Riopelle, 1995 and NRMP, 1996a). The main source of the difference between West Lombok and Bunaken is probably due to the difference in catch rates used (see above).

There is no information available for fishing costs in the Togean Islands and we assume a *Cost per Fisher per Day* of Rp.6,000, in line with the information from West Lombok and Bunaken. With 3,609 fishers and a 240 day season, *Total Cost* is estimated at Rp.5.2 billion/year (6000 x 3609 x 240). The uncertainty in this estimate is also addressed in the *Low Value Scenario*, as explained further below.

[5] During the workshop an error was made in calculating the profits of fisheries. In calculating the high value scenario for fisheries the average price was not corrected to allow for the weight differential between fresh and dried fish. Correcting for this weight difference reduced the High Value Scenario by ~30%. The error does not affect the results of the workshop, which were based on the Low Value Scenario (see below).

Addressing uncertainty

The description of the methodology given above reveals the number of assumptions that are required to estimate profitability in light of the limited information available for the Togean Islands fisheries. In order to allow for uncertainties in the data, two scenarios - high value, and low value - are proposed. The *High Value Scenario* uses the information described above. The *Low Value Scenario* sets *Total Revenue* 50% lower[6] and *Total Cost* 80% higher. The 50% reduction in *Total Revenue* (equivalent to using an *Average Price* of Rp.1,000/kg, or an annual *Total Catch* of 6,700 tons/year) is considered excessively cautious, particularly in light of the high *Total Cost* figure used.

2.4.3 Results

Table 9 – HIGH VALUE SCENARIO

Figure	Calculation	Result
Total Revenue	= Total Catch x Average Price = 13.4 million (kg) x 2,000 (Rp./kg)	Rp. 26.8 billion
Total Cost	= Cost/fisher/day x Fishing season x Number of fishers = 6,000 (Rp.) x 240 (days) x 3M609 (fishers)	Rp. 5.2 billion
Profit (per year)	= Total Revenue - Total Cost = Rp.26.8 billion – Rp.5.2 billion	Rp. 21.6 billion
NPV	**(over 25 years, 10% discount rates, constant profits)**	**Rp. 196 billion**

Table 10 – LOW VALUE SCENARIO

Figure	Calculation	Result
Total Revenue	= 50% lower than in High Value Scenario = e.g. 9,475,000 (kg) x 1,414 (Rp/kg)	Rp.13.4 billion
Total Cost	= 80% higher than in High Value Scenario[7] (i.e. costs per fisher per day = Rp.10.,50)	Rp.9.4 billion
Profit (per year)	= Total Revenue - Total Cost = Rp.13.4 billion – Rp.9.4 billion	Rp.4.0 billion
NPV	**(over 25 years, 10% discount rates, constant profits)**	**Rp. 36.31 billion**

[6] This is equivalent to a 30% reduction in both *Total Catch* and *Average Price* (i.e. 9,475,000 (kg) x 1,414 (Rp./kg) = Rp.13.4 billion), or a 50% reduction in either *Total Catch* or *Average Price*.
[7] in the Low Value Scenario costs are 70% of *Total Revenue*

2.4.4 Participatory Input and Conclusions

Three main pieces of information were obtained from workshop participants:

(1) the *Number of Fishers* used was too low

Considerable surprise was expressed by workshop participants at the low number of fishers used in the analysis. However, in Bunaken 12% of the total population were identified as fulltime fishers (2,555 fulltime fishers out of a total population of 21,371 - NRMP, 1996a), identical to the percentage estimated independently by SKT for the Togean Islands. The answer to this difference in perception regarding the number of fishers may lie in the distinction between fulltime and part-time fishers. As noted by workshop participants, the majority of Togean Islanders are likely to fish at some point during the year. Without field based surveys it is not possible to ascertain how much part-time fishers might contribute to the fisheries sector in the Togeans, although the widespread surprise at "such a low number" indicates the contribution may be substantial.

(2) the *Fishing Season* used was too long

The Fisheries Department representatives informed the meeting that a 160-day season is assumed as standard for artisinal fisheries in Indonesia. This would appear to reduce the value of the fishery. However, *Total Catch* is the product of the *Number of Fishers*, the *Fishing Season*, and the *Catch Rate*. Assuming *Total Catch* and *Number of Fishers* (fulltime) are approximately correct, a *Fishing Season* of 160 days results in an actual *Catch Rate* of 23.2 kg/day. This figure is within the ranges seen in other artisanal Indonesian fisheries (Riopelle, 1995 and NRMP, 1996a). Using these new reasonable figures for *Fishing Season* and *Catch Rate* means *Total Catch* remains the same and hence *Total Revenue* remains the same, while *Total Cost* declines. As this illustrates, the uncertainty regarding the length of fishing season and catch rate need not necessarily alter the results of the analysis. However, if *Catch Rate* and *Number of Fishers* are held constant (at 15.5 kg/day and 3,609 fishers respectively) and the *Fishing Season* shortened to 160 days, then *Total Catch* is reduced to 8,950 tons/year. Therefore the estimate of 13,400 tons/year may be an over-estimate. However, as noted above, the higher catch rates necessary to generate 13,400 tons/year fall within the range observed for other Indonesian fisheries.

(3) costs are considerably lower than estimated in the analysis

Total Cost was considered to be much lower than the 70% of *Total Revenue* used in the *Low Value Scenario*. This input is consistent with the information on costs and catch rates from other artisinal Indonesian reef fisheries as noted above. Any reduction in the percentage costs figure used will increase the annual *Profit* in the fishery considerably, although *Total Revenue* will not be affected.

Conclusions:

Further field research would be required to resolve the uncertainties described above. However, as noted in the discussion, if the available economic information is already adequate for decision-making then there is no requirement for further research (the information is "sufficient"). In this case, workshop participants agreed that fisheries revenues were likely to be slightly higher than estimated under the *Low Value Scenario*, while profits would be considerably higher. Therefore the *Low Value Scenario* represents a minimum value of the Togean Islands fishery. If the benefits (profits) of a development activity are less than the costs it imposes on fisheries activities, then the development activity can be rejected without more detailed analysis of the economic value of the fishery (see Section 1). Thus currently available economic information may be sufficient for guiding spatial planning, particularly at the district level geographically, and at the industry sector level economically.

Note, however, that the analysis presented above cannot assess the incentives of fishers accurately and is therefore insufficient for developing fisheries policies, management plans (including zonation at the sub-district level) or regulations. The fisheries of the Togeans appear similar to those of Bunaken, and it is worth summarizing a conclusion of the NRMP study (1996a). They cautioned that the complexity of the fisheries (many different fishing grounds, vessel types, gear types, and fishing techniques) meant that aggregating fishing activities into one fisheries sector was inappropriate and could lead to incorrect conclusions and management recommendations.

However, although a traditional analysis of fisheries (as carried out by NRMP, 1996a) should identify the economic incentives facing fishers, other factors also need to be considered. Fishers in the Togeans are reported as borrowing money from traders and lenders to finance their fishing activities (Saad, 1992). The fish are then sold to the trader/ lender (with no previous agreement on price), who reduces their income according to how much they borrowed (Saad, 1992). The debt is never fully paid off and many fishers have been kept in poverty for many years (Saad, 1992). A debt burden, which a traditional analysis of fishing productivity, costs and revenues would not typically detect, can alter the incentives of fishers drastically. Similarly, agricultural and trading opportunities need to be known in order to understand the incentives and dynamics of the part-time fishers. Therefore a more wide-ranging survey of community livelihoods and activities is required to develop good fisheries policies, management plans and regulations. Also, this analysis of an aggregated fisheries sector doesn't address the distribution of fisheries profits across socio-economic groups or within and outside the Togean Islands. The equity issues may be important for management planning but can not fully addressed in this analysis.

2.5 Assessing Development Options

2.5.1 Introduction

For logging to be the economically rational development choice in the Togean Islands the benefits from logging must be greater than the costs that arise from the impact of logging on the economic activities carried out under multiple-use conservation. In Section 2.2 we determined the benefits of logging in the Togeans, while in Sections 2.3 and 2.4 we determined the benefits of tourism and fisheries respectively. In this section we place a value on the costs of the impacts of logging on both tourism and fisheries and then compare these costs with the benefits of logging.

The logging effect we consider here is increased erosion resulting in downstream sedimentation and the impact that has on coral reefs. The thick canopy, vegetation and leaf-litter in pristine tropical forests are very effective at preventing soil erosion and little downstream sedimentation occurs. Erosion rates under natural forest are 90% lower than under traditional slash and burn agriculture, and 99% lower than under weeded plantations (Chomitz and Kumari, 1998). Logging roads and log yards increase erosion 260 times relative to natural forest, so that even relatively selective logging results in relatively high erosion rates (Hodgson and Dixon, 1988).

The effect of increased erosion rates on downstream sedimentation depends on the size of the watershed. In large watersheds there is more opportunity for the eroded soil to be re-deposited within the watershed and the sediment delivery ratio (the proportion of eroded soil in a watershed that is carried by a stream) can be as low as 10%. However, in small coastal watersheds – like those of the Togeans – almost 100% of eroded soil is delivered as sediment (Mahmood, in Chomitz and Kumari, 1998). The short distance between the erosion source and the reefs in the Togeans means that there will be little or no time lag before any land use changes cause increased sedimentation on the coral reefs.

Sediment deposition is thought to lead to oxygen and nutrient starvation that can cause the death of corals or increase their susceptibility to disease (Hodgson and Dixon, 1988). In their 1988 study of logging impacts on reefs in Palawan, Philippines, Hodgson and Dixon found that the increased sedimentation reduced coral cover by 50%. The following sections determine the costs of such an impact for tourism and traditional fisheries.

2.5.2 Cost of Impact on Tourism

Coral reefs are the main attraction for tourists visiting the Togean Islands, particularly for the higher spending dive tourists. Increased sedimentation results in loss of live reef cover and reduced underwater visibility, significantly reducing the attraction for dive tourists. In Palawan it was estimated that logging sedimentation impacts would reduce the number of international dive tourists to zero within a few years. The absence of international dive tourists was predicted to reduce tourism revenues by 83% (Hodgson and Dixon, 1988). Access for international dive tourists to the Togeans is difficult, and if logging continues and diving conditions deteriorate, these tourists may not make the effort to visit the islands.

If international dive tourists do not visit the Togeans, the High Value Scenario determined in Section 2.3 will not occur and the Low or Medium Value Scenarios are more realistic. The NPV of the *Medium Value Scenarios* is Rp.15,418 million lower than under the *High Value Scenario*.

2.5.3 Cost of Impact on Traditional Fisheries

A reduction in living coral cover due to sedimentation reduces food availability for fish, with corresponding declines in fish populations (Hodgson and Dixon, 1988). In his study of Indonesian reefs, Cesar (1996) assumed reefs that are 50% destroyed (defined as the ratio of dead coral cover to total coral cover) have a 50% lower maximum sustainable yield. Based on extensive field measurements, a 50% decline in coral cover was also predicted to cause a 50% reduction in fish catches in a study of logging impacts in Palawan, Philippines (Hodgson and Dixon, 1988).

The logging operation described in Section 2.2 harvested 750 ha each year. Logging operations take place in strips along the coast, suggesting that each hectare logged results in significant extra impact on the reef. It was assumed that 5 meters of coastline were impacted for every hectare logged. Thus logging 750 ha of forest resulted in approximately 1.5% (3.74 km) of the Togean's coastlines and reefs being affected by sedimentation every year. Because coral reefs rebuild slowly, the effects of sedimentation are cumulative and we can assume that the extent of reef affected grows by 1.5% a year. Following the findings of Hodgson and Dixon (1988, discussed above), this sedimentation resulted in a 50% decline in reef cover, and 50% lower fish catches. If half the coral on 1.5% of the reef is affected and fish catches are reduced by half, then profits will be 0.75% (half of 1.5%) lower. Using the *Low Value Scenario* of Rp.4 billion/year, this translates to a decline in profits of Rp. 30 million every year. This effect would be cumulative as more reef area is negatively affected each year. After 25 years of logging, 37.5% of the reef would be impacted, resulting in a (cumulative) 18.75% decline in annual fisheries profits from Rp. 4 billion to Rp. 3.25 billion. The increase in the area of reef affected, and the corresponding decline in annual fisheries profits (under these assumptions) is shown in Table 11.

Table 11 – IMPACT OF LOGGING ON FISHERIES

Year	% of reef impacted	*Low Value Scenario* Profit (million Rp.)
1	1.5%	3,970
2	3.0%	3,940
3	4.5%	3,910
4	6.0%	3,880
5	7.5%	3,851
6	9.0%	3,821
7	10.5%	3,791
8	12.0%	3,761
9	13.5%	3,731
10	15.0%	3,701
11	16.5%	3,671
12	18.0%	3,641
13	19.5%	3,612
14	21.0%	3,582
15	22.5%	3,552
16	24.0%	3,522
17	25.5%	3,492
18	27.0%	3,462
19	28.5%	3,432
20	30.0%	3,402
21	31.5%	3,373
22	33.0%	3,343
23	34.5%	3,313
24	36.0%	3,283
25	37.5%	3,253
NPV[a]		**34,014**

[a]) Calculated using a 10% discount rate.

In summary, the cumulative effect of sedimentation over 25 years would reduce the NPV of the Low Value Scenario for fisheries (compare Tables 10 & 11) from Rp.36,310 million to Rp.34,014 million, a reduction of Rp.2,294 million.

2.5.4 The Economic Case for Conservation versus Logging

The overall economic case for logging can be determined by comparing the costs of the impact to tourism and fisheries to the estimated profits from logging. Table 12 summarizes the impact values from the last 2 sections together with the forestry profit results from Table 3.

Table 12 – THE ECONOMIC VALUE OF FORESTRY

Profits and Losses		
Profits from forestry	Rp.	+4,113 million
Reduction in tourism profits[a] (due to reduced visibility etc).	Rp.	-15,418 million
Reduction in fisheries profits (due to situation and reduced catch)	Rp.	-2,294 million
Economic value of logging	**Rp.**	**-13,599 million**

[a]*) Based on the difference between the tourism High and Medium Value Scenarios*

We compare the best case scenario from forestry with conservatively estimated costs that it imposes on other sectors. Subcontraction shows that the profits of logging are significantly outweighed by the costs of the impacts on tourism and fisheries, thus logging is economically unattractive[8].

Sensitivity Analysis

It should be noted that the finding that logging is economically unattractive is robust for three reasons: (1) the economic cost of logging impacts was evaluated conservatively; (2) despite this conservative assessment, the costs of logging far outweighed the benefits; and (3) a number of other potentially significant impacts were not valued (as discussed in the conclusions below).

The economic benefits of logging were evaluated using the High Value Scenario, while the economic costs imposed on fisheries and tourism were evaluated conservatively. Despite the conservative evaluation of external (imposed) costs, they significantly outweighed the optimistic assessment of private logging profits. This means that the impact of logging derived sedimentation on coral reefs, and the effect this has on tourism and fisheries, could be evaluated even more conservatively but the costs of logging would still outweigh the benefits.

The combined costs imposed on the fisheries and tourism sector only need to exceed 4,1 billion Rp. for logging to be rejected on economic grounds. Consider that a reduction in tourism profits due to logging and siltation as small as 10% (rather than a reduction from High to Medium Value Scenario) amounts to about Rp.2.9 billion in losses. These very conservative tourism losses, together with the fisheries losses, would be sufficient to tip the balance away from forestry. Even if the High Value Scenario for tourism were an overestimate[9], a reduction in profits of 20% based on the Medium Value Scenario would generate losses of Rp.2.7 billion, also sufficient to argue against forestry on economic grounds.

[8] The result is different in magnitude from that determined at the workshop due to errors in calculating tourism profits, but the conclusion that logging is economically unattractive remains unchanged.

[9] but note that even the *High Value Scenario* for tourism was considered to be too conservative by workshop participants.

2.6 Conclusions of Valuation

The environmental and social costs (or "externalities") associated with logging are larger than the private benefits (or profits) that can be gained by logging. In other words, this development activity produces more costs than benefits to society as a whole. This provides an economic rationale for rejecting forestry as a development activity. Even though some enterprises would obtain private benefits from logging, fishers and tourist operators would stand to lose more if the logging activity were allowed. Note that this result holds with only part of the environmental costs assessed.

We have studied the impact of sedimentation on fisheries and tourism only. Other costs, such as biodiversity, water retention, other environmental services, carbon sequestration, have not been valued. The partial analysis is sufficient to illustrate the trade off between logging and other valuable economic activities - even without placing values on some other less tangible environmental services.

In addition to the tourism and fisheries revenues described above, conservation has numerous other benefits for the Togean communities. Additional benefits of tourism include improved transportation to and from the mainland and between the islands. The extra revenue provided by tourists will be sufficient to attract transportation sector investors to the islands. As a result of this investment, local communities will enjoy improved transportation as well. More ferries and inter-island transport also presents an opportunity to transport water - a key requirement identified by Mastaller (1992 - see Introduction). The tourists also create a market for local crafts people to sell handicrafts and souvenirs. Further benefits of conservation are described below when considering the further impacts of logging and other development activities.

2.6.1 Other Impacts of Logging

An additional impact of logging might be a reduction in the quantity and quality of available fresh water. As noted in the introduction, the fresh water supply in the Togean Islands is precarious, and any reductions in supply are likely to result in several costs. These costs could include loss of earnings for fishers[10] and others (who may have to spend time getting water instead of working), less tourists (not enough water), and/or reduced health resulting from poorer quality water.

The physical link between forest loss (either due to logging or agricultural conversion) and reduced water supply remains to be quantified in the Togeans. However, evidence from around the world suggests that in small watersheds (such as those of the Togeans) the removal of forest

[10] Our evaluation of the fisheries sector suggests monthly earnings of between Rp.132,000/fisher and Rp.539,000 /fisher (Low and High Value Scenarios respectively, including shadow wage). This income range spans that for coconut pickers (Rp.300,000/month) and processors (Rp.375,000/month) reported by Wirawan in 1992. If 10% of fishers' earnings were lost every month because time was spent collecting water from more distant wells then the total costs would have an NPV of between Rp.656 million and Rp.2,677 million (Low and High Value Scenarios respectively).

cover does indeed alter hydrology (for a discussion see Chomitz and Kumari, 1998). The precarious nature of water supply in the Togeans suggests that a precautionary approach to further removal of forests is appropriate.

Forest loss and degradation also results in the loss of terrestrial biodiversity. Much of the value of biodiversity is "intangible" - it may not have direct use value but we value its existence ("existence" value) and we place a value on retaining biodiversity so that ourselves or others have the option to enjoy biodiversity now or in the future ("option" and "bequest" values). However, biodiversity does have some more tangible benefits. Direct benefits to Togean Islanders come from the collection of non-timber forest products (NTFPs) such as rattan and honey, which contribute significantly to household incomes in several villages. While the forests and their wildlife are secondary attractions for the majority of tourists likely to visit the Togeans, the addition of tropical forest activities increases the number of things for tourists to do and can increase the length of their stay in the Togeans. The recent opening of the Limbinato boardwalk and its popularity with tourists illustrates this point.

Logging also significantly increases fire risk by increasing the volume of dead wood (fuel) and creating gaps in the canopy which dry out the forest. One cost of this increased fire risk is that it may preclude the use of fire in clearing agricultural land. More familiar costs include smoke-related illnesses and the loss of tourism revenues.

2.6.2 Other Development Activities and Impacts

In the Introduction (Section 1) a summary of the main threats to the environment was provided. Further details are provided below for destructive fishing techniques, with some comments on conversion of forests for agriculture.

Destructive Fishing Techniques - Cyanide and Blast Fishing

While blast fishing with explosives has a long history in the Togeans, cyanide fishing is a relatively recent phenomenon, appearing only in 1991/92. The first live-fish trader arrived in 1992 and set up one camp. There are now around ten collection points managed by at least two firms. The first trader reported collecting 300 Napoleon wrasse per month in 1992, while he now collects less than 100. Where the fish used to be large (considerably greater than 10kg), such large fish are now extremely rare. The majority of the live fish traded are now other less valuable species (i.e. Sono). This is the classic picture of over-exploitation and unsustainable fishing development where large private benefits to a select few fishers but these benefits are short lived. The target species are rapidly over-fished and catches fall within a few years. Certain target species, such as Napoleon wrasse, may even face local extinction. The trade is driven by one or two companies exporting the fish, predominantly to Hong Kong. Large vessels arrive direct from Hong Kong once or twice a month. The trader buys wrasse at Rp.15,000/kg and sells these on to the transport boats at up to US$ 47/kg.

These destructive fishing practices also result in large costs being imposed on the traditional fishers. The depletion or extinction of certain species can result in ecological imbalances that

present a serious threat to the coral reef ecosystem. For instance, the Napoleon wrasse eats Crown of Thorn starfish and it is believed that reducing the number of wrasse can be a factor behind Crown of Thorn outbreaks. The Crown of Thorn eats live coral and a single outbreak can destroy an entire reef. Bombing and cyanide fishing also kill large amounts of coral and can destroy the coral reefs that support traditional fisheries. As described in the assessment of logging impacts, the loss or degradation of coral reefs will also reduce the profitability of tourism. Therefore, destructive fishing results in short term benefits for few people while resulting in long term costs for many.

There is an absence of reliable data on destructive fishing practices and their impacts on the Togeans. Cesar (1996), estimated that cyanide fishing generated a NPV of US$ 234 million for Indonesia but resulted in tourism losses of US$ 280 million. However, the live fish trade is potentially sustainable and highly profitable if lower impact fishing methods are used. Hook and line fishing with decompression of fishes' swim bladders causes little damage to coral reefs and results in less captured fish dying. Cesar (1996) estimated the NPV of the live fish trade using this fishing technique as US$ 320 million, with little or no impacts on tourism and other fisheries. Target populations may still be over-fished using this method and the incentives to use cyanide are likely to continue. Therefore, it will be necessary to include conservation and fisheries enforcement measures (such as Marine Protected Areas or "no-take" zones and cyanide detection) to complement programs training fishers in the hook and line decompression method. Palu fisheries department officials raised an interesting objection to the use of the hook and line decompression method, noting that it is not size selective and could result in too many young fish being caught.

The local Togean fishers have a good understanding of the threat that destructive fishing practice present to their long-term fish catches. Unfortunately there do not appear to be any customary marine tenure laws that entitle them to protect an area. However, even if they were entitled to protect an area, they have no way of controlling access to any but the closest reefs. These close-by reefs are generally in poorer condition than reefs further offshore which had not been subject to the same degree of fishing pressure.

Agricultural Conversion

Many of the impacts of agricultural conversion of natural forest are similar to the impacts of logging (e.g., increased sedimentation on coral reefs, potential damage to water supply, loss of biodiversity). In the case of agriculture, increased erosion can rapidly remove the fertile soil required to support crop yields. If this occurs, agricultural yields decline over time. Fire is often deliberately used to clear forestland for agriculture. On the small islands of the Togeans the use of fire is highly risky. One fire alone can destroy most if not all of the vegetation - forests or crops - on small islands.

2.6.3 Equity and Distribution of Benefits

A key consideration for decision-makers and stakeholders is the distribution of benefits from different activities. The majority of benefits from certain activities, such as traditional fishing,

accrue to the fishers and the Togean communities. However, other development activities may be highly profitable, but it may not be in the interests of the local communities to support such an activity if the majority of the benefits are "exported". One good example of such an activity already exists in the Togean Islands: pearl farming. While pearl farming is thought to be highly profitable, little or no benefits accrue to local communities. Few local people are employed in the sector and the majority of profits are repatriated to outside investors. While the pearl farm companies are thought to make significant license payments to the Government of Indonesia to use the sites, local perception is that little of this money is reinvested in the Togeans. Although the pearl farms have little social and environmental impacts and impose limited costs on local communities (due to removal of fishing grounds and longer journeys to go around the farms), these costs outweigh the small benefits received by the community. Thus many in the local communities are unhappy about the pearl farms and do not see them as economically attractive development options.

Similarly for logging, little of the benefits are retained by the local communities, but in this case the impacts and economic costs imposed on the communities are considerably greater. The main benefits of logging came from employment for some of the young men in the communities as logging crewmembers. Yet very few were employed and the total benefits were small. Note, however, that the analysis presented above suggests that even if all the profits of the logging operation were retained in the Togeans, the losses to fishers would probably still exceed the benefits to the loggers. A similar result may be found in the case of the live fish trade, where substantial benefits accrue to fishers using cyanide, and to the outside investors and traders (i.e., the live fish transporter boats from Hong Kong).

The situation with respect to tourism is more complex. Unless steps are actively taken to capture tourism revenues locally, it is possible for the majority of benefits to accrue to outside investors. Some of the possible steps that could be taken were outlined previously in the tourism section. Sekber Konsorsium Togeans (SKT) and other NGOs are working to ensure that much of the benefits of tourism are delivered to local communities, and created the Togean Eco-tourism Network (TEN) to support such activities. It is ultimately in the own interests of the tourism operators to ensure that sufficient benefits from tourism are delivered to local communities to provide them with incentives to conserve the coral reefs.

3. PARTICIPATORY WORKSHOP RECOMMENDATIONS

The main workshop recommendations for development in the Togeans were:

1. There should be no further logging on the Togean Islands. In follow up discussions with BKSDA and SKT the following points were identified as necessary to ensure no further legal logging takes place:

   1.1 Kanwil Kehutanan stated at the workshop that they did not intend to issue any new concessions for forestry in the Togeans. Ideally all forest outside the APL (*Areal Penggunaan Lain*) zone should be zoned by Kanwil Kehutanan as Hutan Lindung (as a minimum requirement – higher levels of conservation protection may be possible and necessary).

   1.2 The majority of the land on the Togeans has recently been designated as APL. Responsibility for permitting commercial forestry operations in these areas falls to Dinas Kehutanan. The Dinas Kehutanan is apparently preparing a concept letter that states that it will not issue any forestry licenses in the APL zone on the Togeans. It should be confirmed that this does not preclude community forestry to supply own needs.

   1.3 Furthermore, a case should be made to Dinas Kehutanan for protection of the following: (1) mangrove forests and coastal forest (to prevent sedimentation on the coral reef); (2) forest areas critical to protect the quantity and quality of fresh water supply, such as forest around springs (to prevent runoff entering the drinking supply) and on steep slopes (to minimize runoff and allow rainfall to enter the water-table).

2. BPN, the state office responsible for giving licenses for agricultural land use in HK (*Hutan Konversi*) and APL zones, were invited but did not attend the workshop. They should be informed of the workshop findings and recommendations (namely, the value of forest for water supply, and for tourism and fisheries by protecting coral reefs from sedimentation). No licenses should be issued by BPN in HK or APL zones without further economic valuation and community consultation.

3. There are currently two Governor decrees for the Togean Islands: (1) Taman Wisata Alam; and (2) Paduserasi. The Paduserasi decree came later and has precedence, but it has no Taman Wisata Laut shown. This contradiction needs to be resolved, and economic valuation can help identify areas for conservation in the Togean Islands. This suggestion fits in with comments from spatial planners in Bappeda TK1 that economic valuation would be a useful tool in demonstrating why rational spatial planning is required in Indonesia in general.

4. The partial results obtained from this workshop suggest that conservation may be the best development investment for local communities and the general economy in many areas of Central Sulawesi.

In addition to these recommendations regarding development options in the Togeans, the workshop made several recommendations for improving the participatory valuation approach. The results of the participatory valuation workshop were generally encouraging. The suggestions to ban logging that were voiced at the workshop suggest that decision-makers are reasonably comfortable with the concept of sufficient information and will take certain decisions based on the results from rapid valuation methods. The participatory nature of the workshop worked very well in drawing out existing data and information from experts from local Government and other organizations. Hence the critical shortfalls in data availability and quality became clear and the necessary future work on data collection and research could be clearly identified.

However, it was strongly suggested that the participatory valuation approach could be improved by:

- consulting and involving local communities more fully;
- reduce the number of assumptions made in the valuation analyses;
- extend the workshop, or hold separate discussions, to more fully describe the concept;
- hold a separate meeting to more fully define how economic value information will be used - and by whom - in reaching decisions;
- having more time with local technical experts to develop the analyses of individual sectors;

Community involvement:

There was concern that local communities should be more involved in the valuation work, and that some thought was needed regarding the way in which local communities could be brought into the decision making process. There was also concern that the current knowledge of community livelihoods and the role of natural habitats were poorly understood, and that better data were required.

Recommendation: Communities need to be consulted and involved more. The data and information gathering needed to improve understanding of community livelihoods may represent an opportunity to involve communities.

Level of precision:

There was some discomfort expressed regarding the number of assumptions required to carry out the valuation exercise given the poor data availability and quality. BAPPEDA expressed an interest in using valuation results to demonstrate the advantages of rational spatial planning and therefore gain support for their work. This use of the valuation results may require considerable accuracy if it is to overcome objections from entities, which stand to lose political power or financial benefits.

Recommendation: The main assumptions were made in two areas: (1) community livelihoods and use of natural resources; and (2) physical changes and impacts resulting from development

activities (i.e. forestry). Reducing the need for assumptions regarding the strength of impacts could require considerable scientific research time and expense – both of which would prevent the valuation approach from being widely used. Given that communities need to be more fully involved, the opportunity exists to do this while simultaneously removing assumptions regarding community resource use.

Economic valuation concept:

The general concept of economic valuation was well understood (i.e. placing values on environmental and ecological impacts in order that these impacts are given due importance in development decisions). However, the key concept of the proposed valuation approach (that values for all impacts may not be required before a decision can be made) was new to many of the workshop participants.

Recommendation: Time and effort should be expended to familiarize decision-makers with the idea that valuing only a few of the impacts may provide enough information to guide decisions. A separate seminar might prove useful to familiarize decision-makers with the more subtle concepts of rapid valuation. This familiarization seminar would ideally be held considerably in advance of discussing the results of economic valuation work so that any questions can be dealt with prior to the workshop.

The context of economic information in decision-making:

Considerable care should be used in describing how the resource valuation approach and the use of its results can fit into the decision-making process. While participants were generally receptive to the need for economic valuation, there was considerable concern over exactly how the information could be used to make development decisions. This concern appears to be due to current uncertainty regarding the role of different stakeholders in the decision making process (i.e. Togean communities and/or Central, Provincial and District Government) and how a consensus among these various stakeholders can be reached.

Recommendation: It is beyond the scope of a resource valuation workshop to decide the appropriate political process to be used in reaching development decisions. Fully involving local communities and other stakeholders will ensure that all relevant parties are aware of the resource economic work and its implications. In future valuation studies, it should be emphasized early on in the proceedings that the results of economic valuation would be useful to all decision-makers and stakeholders. As a minimum requirement, the results of the economic valuations should be made available to all relevant decision-makers and stakeholders from the community level up to central government.

Fully develop analyses with local technical experts before the workshop:

There was a general feeling that the workshop tried to do too many things too quickly. More time was needed to go through the analyses with local technical experts, but this should not be combined with presentation of the results to senior decision-makers and other stakeholders.

Recommendation: that technical focus groups should be set up to prepare the various components of the valuation exercise (i.e. forestry, eco-tourism, fisheries, agriculture, NTFPs, biodiversity). These different focus groups could then meet at a participatory valuation workshop to combine their results. A presentation based on their findings could then be made to decision-makers and stakeholders.

Need for economic analyses of incentives, not just valuation:

While the utility of the valuation results was accepted, there was also interest in using economic analyses to help design resource use policies, regulations and management plans. Economic analysis can help in determining the incentives of different stakeholders. This information can be used to identify the most cost effective policies and regulations that achieve management objectives.

Recommendation: use the information collected for the economic valuation work as the basis for an incentives assessment and the subsequent design of resource and protected area management plans, regulations and policies.

4. DISCUSSION, RECOMMENDATIONS AND FURTHER WORK

In light of the comments and recommendations received at the workshop, the following participatory economic valuation approach is proposed:

Step 1: Preliminary presentations to decision-makers and stakeholders to explain the context and concept of resource valuation. Separate presentations may be made to: (a) senior decision-makers; (b) local technical experts; (c) community leaders and stakeholders.

Step 2: Collection of community data to feed into technical focus groups and help involve local communities in valuation process.

Step 3: Technical focus groups are formed which gather necessary data and information and assess: (a) the profits of their activity; (b) the environmental conditions required by their activity, and how the profits of their activity may change in response to changes in these conditions; (c) the physical changes (impacts) that result from their activity; and (d) the distribution of the profits of their activity, and how this distribution might need to be altered. Technical focus groups may include representatives from the relevant government department and business sector, as well as NGOs and local communities.

Step 4: Carry out a technical participatory valuation workshop for the technical focus groups. The assessments made in step 2 can be combined to determine the economic costs of the impacts of different activities as measured by changes in productivity or earnings in the other activities. Such a valuation workshop would also help coordination between Government departments.

Step 5: The results of the participatory valuation workshop can then be presented to: (1) senior decision-makers; (2) local technical experts; (3) community leaders and stakeholders. Local experts who took part in the focus groups would preferably present the results.

Step 6: The data and information gathered as part of the valuation exercise is used to assess stakeholder incentives and design cost effective management policies and regulations that will deliver the desired land and resource use.

Activities similar to the six steps described above are required in the Togean Islands. Sekber Konsorsium Togeans has planned for a community data gathering exercise, which will collect the necessary community livelihood data and information for economic valuation work. The participatory workshop and other work that has already been carried out represent significant contributions to Steps 1, 2, 3, 4 and 5. Once the necessary data has been collected it is necessary to complete Steps 3, 4 and 5 and then move forward in preparing the analyses required for Step 6.

The participatory valuation workshop of September 23rd, 1998 in Palu, Central Sulawesi, was a useful step forward in providing economic information to guide development activities, land

use and resource extraction activities. The workshop brought together participants from NGOs and Government departments of agriculture, forestry, fisheries, tourism, conservation, environmental impact assessment and spatial planning. As a result of the participatory sessions, each department improved its understanding of the others' activities, plans and concerns. Developing the participatory valuation work to fully involve other stakeholders, including local communities, will lead to an even greater understanding between different groups and improve the information used in the valuation analyses.

APPENDIX 1
BIBLIOGRAPHY

BIBLIOGRAPHY

Anon., 1994. Rencana Karya Tahunan Pengusahaan Hutan (Tahun 1994 / 1995): PT. Arrow - M. Gobel.

Anon., 1998. Studi Diagnostik HPH Bina Desa Hutan (PMDH) HPH PT. Satyasena Indratama. Kab. Dati II Donggala, Propinsi Sulteng. SK HPH: 81/Kpts-II/1997.

Cesar, H. 1997. Indonesian Coral Reefs - An Economic Analysis of a Precious but Threatened Resource. Ambio. Vol 26. pp. 345-350.

Cochrane, J. 1992. Report on Tourism in: Siberut Island, Togean Islands, Ruteng Mountains and Lorentz Nature Reserve. In "Management and Conservation of Tropical Forest Ecosystems and Biodiversity: Siberut Island, Togean Islands, Ruteng Mountains, Lorentz Nature Reserve", 1992. ADB / GOI.

Cesar, H. 1996. Economic Analysis of Indonesian Coral Reefs. World Bank Environment Department.

Hodgson, G. and Dixon, J.A. 1988. Logging versus Fisheries and Tourism in Palawan: An Environmental and Economic Analysis. East-West Environment and Policy Institute Occasional Paper No. 7.

NRMP. 1993. Eco-tourism development in Bunaken National Park and North Sulawesi. NRMP Report No. 30.

NRMP. 1996a. Economic value of fisheries to the residents of Bunaken National Marine Park. NRMP Report No. 62

Riopelle, J.M. 1995. The Economic Valuation of Coral Reefs: A Case Study of West Lombok, Indonesia. MA thesis in Development Economics, Dalhousie University, Halifax.

Saad, Z. 1992. Community development approach for integrated protected area systems (Lorentz, Togean, Ruteng, and Siberut). In "Management and Conservation of Tropical Forest Ecosystems and Biodiversity: Siberut Island, Togean Islands, Ruteng Mountains, Lorentz Nature Reserve", 1992. ADB / GOI.

Scotland, N. and Whiteman, A. 1997. Economic rent in the Indonesian forest sector volume 4: the forest concession industry. Indonesia - UK Tropical Forest Management Program, Report Number: SMAT/EC/97/04.

Surjadi, P. and Supriatna, J. 1998. Bridging Community Needs and Government Planning in the Togean Islands, Central Sulawesi, Indonesia. Presented to the 1998 ICRI meeting, Australia.

Wirawan, N. 1992. Buffer Zone Concept and Activities in the Integrated Protected Area Systems. In "Management and Conservation of Tropical Forest Ecosystems and Biodiversity: Siberut Island, Togean Islands, Ruteng Mountains, Lorentz Nature Reserve", 1992. ADB / GOI.

APPENDIX 2
PARTICIPATORY WORKSHOP – OVERHEADS

WORKSHOP PENILAIAN EKONOMI SUMBERDAYA ALAM KEPULAUAN TOGEAN

23 SEPTEMBER, 1998
PALU, SULAWESI TENGAH

BAPPEDA TK.I SULAWESI TENGAH
NRM2/USAID
KONSORSIUM TOGEAN

Disajikan oleh: Jim Cannon, Conservation International

OHP 1:

TUJUAN WORKSHOP PARTISIPATIF:

1. Menentukan nilai ekonomi dan membuat rekomendasi untuk pembangunan di kepulauan Togean.

2. Kalau nilai ekonomi tidak dapat ditentukan bila diperlukan buat rekomendasi untuk pekerjaan selanjutnya.

3. Evaluasi pendekatan penilaian ekonomi ini, dan membuat rekomendasi untuk perbaikan pendekatan metode ini sehingga hasil workshop dapat bermanfaat.

OHP 2:

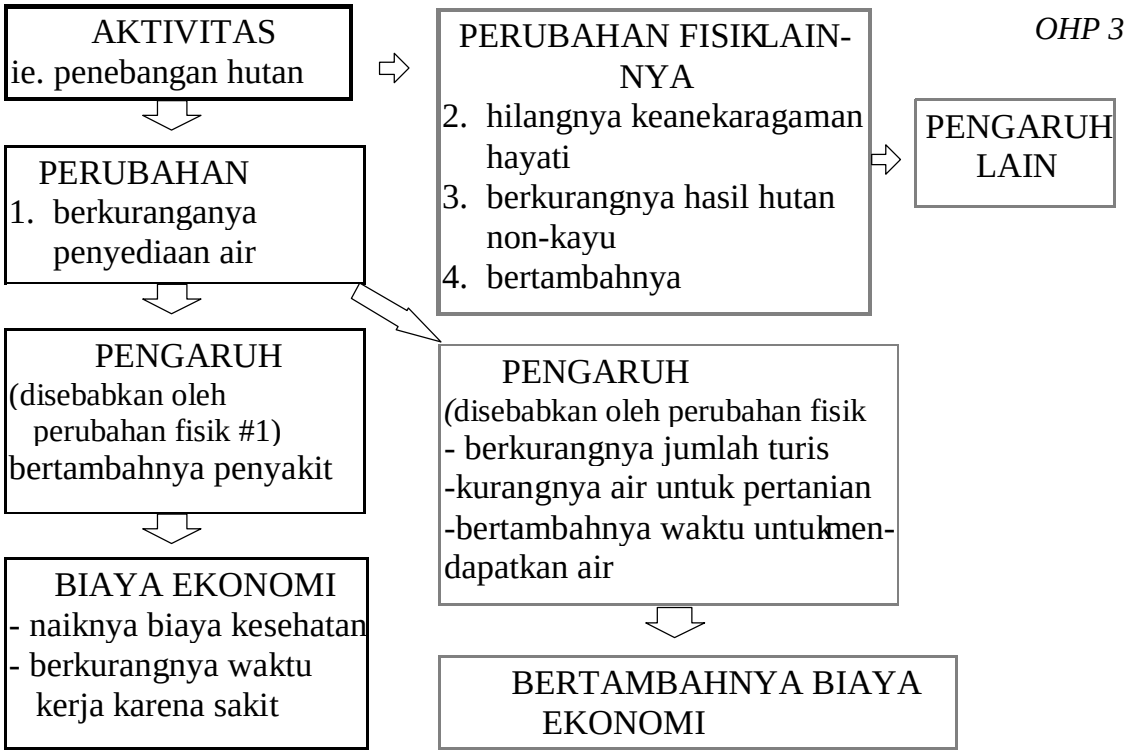
TUJUAN PENILAIAN EKONOMI:

- Menyediakan informasi ekonomi dalam membantu pengambil keputusan mengidentifikasi aktivitas ekonomi dan investasi terbaik untuk pembangunan.

PENILAIAN EKONOMI MELAKUKANNYA DENGAN:

- Memasukkan biaya yang dikeluarkan dan keuntungan yang didapat dari suatu kegiatan ekonomi, yang biasanya tidak dihitung ini, dalam analisa ekonomi kegiatan pembangunan.

Biaya dan keuntungan yang sering tidak dihitung atau dimasukkan ini merupakan dampak pembangunan terhadap lingkungan dan sosial.



OHP 3

TOTAL NILAI EKONOMI

OHP 4

contoh: TERUMBU KARANG

KEGUNAAN:	PRODUKSI	IKAN, KERANG DLL
KEGUNAAN:	NON-PRODUKSI	PARIWISATA DAN REKREASI PENCEGAHAN EROSI PANTAI PENDIDIKAN DAN PENELITIAN PEMELIHARAAN KEANEKARAGAMAN HAYATI
TIDAK DIGUNAKAN	NON-PRODUKSI	NILAI KEBERADAAN NILAI MASA DEPAN

OHP 5:

SYARAT-SYARAT UNTUK MENENTUKAN PENILAIAN ADALAH:

- Nilai ekonomi harus cukup untuk menuntun keputusan pembangunan

- Nilai ekonomi harus dapat dipercaya oleh pengambil keputusan

- Kredibilitas dari nilai ekonomi tergantung pada kualitas data dan cara yang sederhana sehingga metode yang digunakan dapat dimengerti.

- Diharapkan nilai ekonomi ditentukan dengan cepat dan membutuhkan sedikit biaya

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OHP 6 - **TUJUH LANGKAH PENILAIAN EKONOMI**

1. Apakah usulan kegiatan ini sah secara hukum?
2. Apakah nilai ekonomi dari aktivitas ini realistis?
3. Buat nilai ekonomi dari aktivitas yang realistis.
4. Identifikasi seluruh pengaruh yang timbul dari kegiatan ini.
5. Pilih pengaruh-pengaruh yang ingin dihitung.
6. Kerjakan pengaruh nilai ekonomi dengan menggunakan perhitungan yang paling mudah.
7. Jika biaya yang dihitung dari pengaruh di atas sudah melebihi keuntungan yang akan didapat, kegiatan tersebut harus dihentikan.

OHP 7 - **PROSES PENGAMBILAN KEPUTUSAN DENGAN MENGGUNAKAN NILAI EKONOMI**

Contoh:

Perkiraan keuntungan dari usulan kegiatan = 100

* Kaji ulang angka yang diajukan, dikoreksi *

Keuntungan dari usulan kegiatan (setelah di kaji ulang) = 80

Skenario 1:

Dampak 1: Biaya a = 40
Biaya b = 20

Dampak 2: Biaya c = 60
Biaya d = ?

Biaya a + b + c = 120
Biaya a + b + c > 100

Biaya yang dikeluarkan sudah melebihi keuntungan yang mungkin didapat.
*** Usulan kegiatan harus ditolak.

Skenario 2:

Dampak 1: Biaya a = 40
Biaya b = 20

Dampak 2: Biaya c = ?
Biaya d = ?

Biaya a + b = 60

Keuntungan dari usulan kegiatan (setelah dikajiulang) = 80

Jika (berdasarkan pengalaman) perkiraan biaya c + d sudah lebih besar dari (80 – 60), usulan kegiatan harus ditolak!

Metode ini disebut metode “Switching Value”:
Dalam skenario 2 ini, “switching value”nya adalah <u>80 – 60 = 20</u>

OHP 8 - METODE PENENTUAN BIAYA DARI DAMPAK SUATU KEGIATAN

1. Gunakan data yang pernah didapat di daerah lain dan sesuaikan dengan kondisi sosial masyarakat di daerah yang menjadi fokus penelitian.

2. Penghitungan dengan menggunakan harga pasar:
   - Menurunnya produksi karena pengaruh/dampak yang ditimbulkannya.
   - Hilangnya pendapatan karena sakit. Sakit yang disebabkan karena kekurangan air karena penebangan hutan di hulu.Hilangnya pendapatan karena sakit ini dapat dikonversikan dalam rupiah.

3. Perhitungan biaya :
   - Jika kegiatan berubah (misalnya dari penggunaan sianida ke penggunaan pancing), ada biaya yang harus dikeluarkan untuk merubah kegiatan ini. Biaya yang dikeluarkan ini sama dengan biaya dampak yang mungkin ditimbulkan.
   - Biaya pencegahan: tambahan biaya untuk suatu kegiatan dalam menghentikan perubahan fisik di lingkungan.
   - Biaya penggantian: tambahan biaya untuk suatu kegiatan dalam mengganti kerusakan lingkungan yang disebabkan oleh perubahan fisik.

OHP 9 - KESIMPULAN

1. Penilaian ekonomi dari biaya yang tidak dimasukkan/dihitung dapat membantu pengambil keputusan dalam membuat keputusan ekonomi.

2. Biaya yang tidak dimasukkan/dihitung tersebut adalah nilai dari dampak perubahan fisik di lingkungan.

3. Setiap pengaruh/dampak dapat mengakibatkan berbagai jenis biaya, beberapa diantaranya sulit dihitung.

4. Jika penilaian ekonomi akan digunakan secara menyeluruh, metodenya harus cepat, murah, sederhana dan dapat dipercaya.

5. Ada tujuh langkah untuk memenuhi persyaratan tersebut (seperti yang dijelaskan di atas)

6. Metode “Switching Value” yang diperkenalkan di atas dapat menentukan besarnya biaya yang tidak dimasukkan/dihitung sehingga dapat digunakan untuk menentukan apakah suatu kegiatan ekonomi layak dilaksanakan.

7. Pendekatan penilaian ekonomi ini tidak dapat menentukan semua biaya dari seluruh dampak yang ditimbulkan, yang dapat ditentukan hanyalah biaya minimum dari dampak yang sudah diketahui.

8. Walaupun tidak semua dampak dapat dinilai, informasi yang ada dapat menjadi patokan dalam mengambil keputusan.

APPENDIX 3
PARTICIPATORY WORKSHOP – PARTICIPANTS

APPENDIX 4
DEBRIEFING FOR PHPA – OVERHEADS[11]

[11] The analyses presented in Section 2 fully incorporate the suggestions made at the workshop and therefore differ in some respects from the calculations presented at the beginning of the workshop (and from the presentation given to PHPA, copied here).

OHP 1

PRESENTATION TO PHPA - 29 SEPTEMBER - ON:

WORKSHOP PENILAIAN EKONOMI SUMBERDAYA ALAM KEPULAUAN TOGEAN

23 SEPTEMBER, 1998
PALU, SULAWESI TENGAH

BAPPEDA TK.I SULAWESI TENGAH
NRM2/USAID
KONSORSIUM TOGEAN

Disajikan oleh: Jim Cannon, Conservation International

OHP 2

Palu Workshop Agenda

1. Opening remarks by Ketua Bappeda Tingkat I Sulawesi Tengah

2. Introductory presentation describing the concept of resource valuation and outlining the approach by consultant

Participatory sessions

3. The economic value of ecotourism

4. The economic value of traditional fisheries and fresh water supply

5. The profits, impacts and economic value of forestry

6. The profits, impacts and economic value of destructive fishing

Concluding sessions

7. The implications of the workshop results for the Togean Islands

8. Assessment of the utility of the valuation approach

OHP 3 - **PHPA PRESENTATION STRUCTURE**

- The aim of valuation
- The way in which costs arise: an activity results in “physical change”, which causes an “impact” which has a “cost”
- Components of total economic value – coral reef example
- Indonesian requirements of valuation approach
- Seven steps to valuation approach to meet Indonesian requirements
- Numerical example of how economic information guides decision making
- methods for rapidly valuing impacts – benefit transfer, price and cost based
- summary of main points, conclusions

OHP 4 - **TUJUH LANGKAH PENILAIAN EKONOMI**

1. Apakah usulan kegiatan ini sah secara hukum?
2. Apakah nilai ekonomi dari aktivitas ini realistis?
3. Buat nilai ekonomi dari aktivitas yang realistis.
4. Identifikasi seluruh pengaruh yang timbul dari kegiatan ini.
5. Pilih pengaruh-pengaruh yang ingin dihitung.
6. Kerjakan pengaruh nilai ekonomi dengan menggunakan perhitungan yang paling mudah.
7. Jika biaya yang dihitung dari pengaruh di atas sudah melebihi keuntungan yang akan didapat, kegiatan tersebut harus dihentikan.

OHP 5 - **PROSES PENGAMBILAN KEPUTUSAN DENGAN MENGGUNAKAN NILAI EKONOMI**

Contoh:

Perkiraan keuntungan dari usulan kegiatan = 100

* Kaji ulang angka yang diajukan, dikoreksi *

Keuntungan dari usulan kegiatan (setelah di kaji ulang) = 80

Skenario 1:

Dampak 1: Biaya a = 40
Biaya b = 20

Dampak 2: Biaya c = 60
Biaya d = ?

Biaya a + b + c = 120
Biaya a + b + c > 80

Biaya yang dikeluarkan sudah melebihi keuntungan yang mungkin didapat.
*** Usulan kegiatan harus ditolak.

Skenario 2:

Dampak 1: Biaya a = 40
Biaya b = 20

Dampak 2: Biaya c = ?
Biaya d = ?

Biaya a + b = 60

Keuntungan dari usulan kegiatan (setelah dikajiulang) = 80

Jika (berdasarkan pengalaman) perkiraan biaya c + d sudah lebih besar dari (80 – 60), usulan kegiatan harus ditolak!

Metode ini disebut metode “Switching Value”:
Dalam skenario 2 ini, “switching value”nya adalah <u>80 – 60 = 20</u>

OHP 6 - **KESIMPULAN**

1. Penilaian ekonomi dari biaya yang tidak dimasukkan/dihitung dapat membantu pengambil keputusan dalam membuat keputusan ekonomi.

2. Biaya yang tidak dimasukkan/dihitung tersebut adalah nilai dari dampak perubahan fisik di lingkungan.

3. Setiap pengaruh/dampak dapat mengakibatkan berbagai jenis biaya, beberapa diantaranya sulit dihitung.

4. Jika penilaian ekonomi akan digunakan secara menyeluruh, metodenya harus cepat, murah, sederhana dan dapat dipercaya.

5. Ada tujuh langkah untuk memenuhi persyaratan tersebut (seperti yang dijelaskan di atas)

6. Metode “Switching Value” yang diperkenalkan di atas dapat menentukan besarnya biaya yang tidak dimasukkan/dihitung sehingga dapat digunakan untuk menentukan apakah suatu kegiatan ekonomi layak dilaksanakan.

7. Pendekatan penilaian ekonomi ini tidak dapat menentukan semua biaya dari seluruh dampak yang ditimbulkan, yang dapat ditentukan hanyalah biaya minimum dari dampak yang sudah diketahui.

8. Walaupun tidak semua dampak dapat dinilai, informasi yang ada dapat menjadi patokan dalam mengambil keputusan.

OHP 7 - **ECONOMIC VALUE OF ECO-TOURISM IN THE TOGEAN ISLANDS**

Current Situation

Number of visitors	=	3500 annually
Average length of stay	**=**	**7 days**
Average expenditure	=	Rp.40,000/day
Total revenue	=	Rp.980 million/year
Profits as % of revenue	=	60%

Scenarios

Low - no change in revenue
Medium - 10% increase every year
High 20% increase every year, to a maximum of Rp.600,000/day/tourist, reached in year 15

Participatory input

High scenario too low because: (1) dive resorts on the Togeans are already charging US$ 100 per day per tourist, and (2) the Togeans is increasingly being offered as part of up market tours to Manado and Bunaken NP.

Conclusion

The high scenario in fact represented a considerable underestimate.

NPV (10% discount rate, 25 years) = Rp.4,555 million

OHP 8 – ECONOMIC VALUE OF TRADITIONAL FISHERIES

Current Situation

Number full time fishers	=	3,609 persons
Total consumption in Islands	=	0.5kg/day/person
% of catch exported	=	40%
Total catch	=	13,400 MT/year
Profits as % of revenue	=	25%
Number of days fishing	=	240/year/fisher

Check – implies catch rate of 2.6 kg/day/fisher

Scenarios

Low price/kg	=	Rp.1,000/kg
High price/kg	=	Rp.4,300/kg

Participatory input

The number of days fished per year is 160, not 240.
Number of fishers is higher than 3,609
Costs are less than 75% of revenue

Conclusion

The low scenario likely to be an underestimate

NPV (10% discount rate, 25 years) = Rp.36,490 million

OHP 9 **– PROFITS OF FORESTRY**

Current Situation

Harvest volume	=	30 m^3/ha
Annual area logged	=	750 ha/year
Price (before crismon)	=	Rp.750,000/m^3
Profit per m^3	=	Rp.25,000/m^3

Scenarios

Low – zero profits
Medium – price recovers over 5 years
High – price recovers over 2 years

Participatory input

No figures suggested

Conclusion

Evaluate first using high value scenario

NPV (10% discount rate, 25 years) = Rp.4,113 million

OHP 10 **– ECONOMIC VAUE OF FORSTRY**

Include economic losses from eco-tourism and fisheries

Eco-tourism

Assumption – damage from sedimentation to reef stops increase in expenditure per day by tourists

Reduction in NPV = Rp.2,455 million

Traditional fisheries

Assumptions

- in each year, sedimentation affects 3.7 km of coastline
- total coastline is 250 km, and 1.5% of reefs affected/year
- there is a 50% reduction in production from these reefs
- use low scenario fisheries value

Reduction in NPV = Rp.2,305 million

Conclusion

Profits from forestry = Rp.4,113 million
- reduction in tourism profits = Rp.2,455 million
- reduction in fisheries profits = Rp.2,305 million

Maximum economic value of forestry = Rp. -646 million

OHP 11 **– RECOMMENDATIONS FOR THE TOGEAN ISLANDS**

1. There should be no further logging on the Togeans

2. BPN should be advised of results and requested to consider economic values before granting licenses

3. Economic valuation would help resolve contradictions in Governor decrees

4. The partial results obtained from this workshop suggest that conservation may be the best development investment for local communities and the general economy in many areas of Central Sulawesi.

APPENDIX 5
TRIP REPORTS

EPIQ/NRM II TRIP REPORT

Jim Cannon (JC)

Manager of Resource Economics Program, Conservation International

RP 1.2 – Protected Area Management Component

Workplan Task/Activity: Natural Resource Economist

Dates of Trip: 19th Feb 1998 to 7th Mar 1998 (15 working days)

PURPOSE of TRIP

- Establish working relationship and consultative/discussion process with local partners
- Preliminary assessment of the information various stakeholders and decision-makers require from an economic valuation of protected areas
- Identify sources for data and information relevant to economic valuation of protected areas
- Prepare detailed plan for remaining work

PRINCIPAL FINDINGS AND ACTIVITIES

- **Working relationships and consultative/discussion processes** were commenced with PHPA (Soewartono), BKSDA (Banjar Loden), LLNP (Hudi Yono and Helmi), USAID (Ketut Jati and Agus Widianto), CI/Yabshi/Ibnu Khaldun consortium (Jatna Supriatna and numerous other staff), TNC (Agung Wibowo and Duncan Neville). Banjar Loden said that NRM 2 staff could work from a BKSDA office when carrying out valuation work in Palu. Soewartono has expressed interest in joining Elfian and I on our proposed follow up trip to Central Sulawesi. It is also hoped that a representative from BKSDA can join us on this trip. Both would be closely involved, together with staff from LLNP and the CI/Yabshi/Ibnu Khaldun consortium, in developing both the strategy for promoting valuation work and the technical approach to be used. Soewartono was also very supportive of a small working group being established at PHPA to discuss resource valuation work in general, and progress on the NRM 2 work specifically. Hudi Yono and Agung Wibowo expressed strong support for a research assistant from NRM 2 to collect in one place information on LLNP available from different sources. The idea of developing a comprehensive library of information and data was also supported by Jatna and Sari for the Togians, with data being collected at BKSDA.

- **The information required from economic valuations by stakeholders and decision-makers** was discussed with Banjar Y. Loden (head, BKSDA, Palu), Hudi Yono (Head of LLNP), Helmi (LLNP), Soewartono (Forester and Agribusiness, Manggala), Jatna Supriatna (CI), Agung Wibowo (director, TNC Palu), staff at CI/Yabshi/Ibnu Khaldun consortium, Neil Byron (CIFOR), David McCauley (IRG). Discussions at the BAPPEDA TK II presentation of the TeknoPlan consultants report for spatial planning of the Togians were also noted, particularly comments by Yufni Bukundapu (Head of Tourism Section, Poso District), Sofyan Rukmana (Head, Spatial Planning Section, BAPPEDA TK I), Peter Ranti (Commission A, Governance, Local Parliament), Nahardi (Head of Forestry and Soil Conservation, PwII) and Yahya Patiro (District Secretary). The priorities were suggested as:

    - revenues that can be captured by the protected area management unit
    - revenues that can be collected by government, both through existing taxes / charges and potential new rent capture instruments (at the village, district, provincial and national levels)
    - economic benefits to communities that are inside the protected areas, or harvest inside the park
    - economic benefits to communities that are dependent on the protected areas for ecosystem services
    - general economic benefits at the village, district, provincial and national levels

Further consultation is required to increase our understanding of the information needs of specific stakeholders and decision-makers. This would be greatly assisted by describing in full the decision-making hierarchy in local government, the spatial planning process, and the protected area proposal and management hierarchy and process.

- **Currently available data** is insufficient for the total economic valuation of the majority of protected areas, given current LOE and information requirements of stakeholders and decision-makers. However, a valuation approach which focuses on economic analyses of specific development threats and protected area benefits has been demonstrated as highly successful in many other countries and has considerable potential in Indonesia. This valuation approach (discussed further in Conclusion 3) utilizes accepted economic analysis methods and market bases data first, and only uses more complex or debated methods such as travel-cost or contingent valuation where this extra information is required. Thus it is anticipated the skill base required will be easier to develop, and that the valuation figures produced are seen as credible. This approach is therefore compatible with NRM 2 PAM goals that local partners see the potential of economic valuation and have the desire and the capacity to carry out their own studies in future.

    - Preliminary Data Source Identification and Assessment

        - Key sources of data available in Jakarta were identified, and a TOR developed for a research assistant to collect the reports / scientific papers / data etc. and enter them into a database which could be linked to the NRM 2 PAM database

        - Similarly, a TOR was developed for a research assistant to be based at BKSDA and LLNP in Palu. This research assistant will collect reports / scientific papers / data etc. at BKSDA for the Togian Islands, and LLNP for Lore Lindu. These will also be entered into a database which could be linked to the NRM 2 PAM database.

CONCLUSIONS AND RECOMMENDATIONS

1) Significant progress was made towards the deliverables due by the end of March under the current TOR. However, because of the delay in USAID approval, consultant's mobilization was delayed until February 18th. This late start does not leave sufficient time to collect the required data prior to the second trip, originally scheduled to occur before the end of March. In order to allow sufficient time for data collection, the second trip must be delayed until April. The deliverables originally scheduled for the end of March 1998 will be delivered in full in late April / mid-May 1998.

2) Previous economic valuation work in Indonesia (under NRMP and others), while of good quality, has not generally had the impact desired at policy level. Three factors were identified for this under-performance:

    - Certain of the methodologies used were not fully accepted as credible by decision-makers
    - Estimates of economic values were seen to be too imprecise, and their significance relative to the economic value of development not adequately explored
    - Insufficient focus was given to the information required by key decision-makers (rent captured by the management unit, local government, local communities and the contribution to provincial/national economies)

    However, the previous economic valuation work by NRMP has a valuable role in the technical approach to economic valuation to be undertaken under the current TOR. In particular, these previous analyses provide a good source of information on certain values that can be included in the analyses, proposed here using the benefit-transfer approach.

3) The technical approach proposed here seeks to address the three main factors identified above. The methodologies used will be selected, through a consultative process, to address specific threats to protected areas. It is anticipated that analytical methodologies will be ranked according to both their simplicity, and the precision of their output. This approach means that assessments of the opportunity cost of protection and the value of direct use by the local communities (using the methods of change-in-productivity, replacement cost etc.) will be undertaken first. An accurate assessment of the economic performance of the proposed non-conservation development (equivalent to the opportunity cost of not proceeding with that development) can help reduce the size of the economic value of conservation that must be demonstrated in order to make an economic case for protected areas. In many cases the resulting required economic value of the protected area may be sufficiently low that an economic case can be made using only certain conservation values that are easily understood and credible (i.e. direct tourism revenues and watershed protection). Under these circumstances, no estimates of other conservation values are required. Where estimates of the remaining conservation values are required, these may be established using evidence from existing (i.e. NRMP) valuation exercises (the benefit-transfer method). This approach uses simple methodologies first, and hence maximizes the credibility of the results while minimizing the data collection requirements. Because direct use market based values are estimated first, decision-maker concerns (rent capture by the management unit and local community's etc.) are addressed simultaneously. The approach, broadly known as the "switching value" approach, has a proven track record of success in persuading decision-makers in other countries to support protected areas.

4) Three sites for valuation exercises have been identified: the proposed Togian Islands protected area (TI); Lore Lindu National Park (LL); and Gunung Gede Pangrango National Park (GG). There are several different and important rationale for selection these sites.

- They are individually important in the maintenance of biodiversity that is unique to each area
- They span a range of different ecosystem types (marine and terrestrial)
- They span a range of different resource uses and development threats (fisheries, forestry, plantations, agriculture etc.)
- They are each at a different stage of the protected areas management cycle (the Togians is a proposed protected area, Lore Lindu is a new National Park with it's own management unit, and Gunung Gede is a relatively mature National Park)
- They each provide easier access to a different level of decision-makers (i.e. Gunung Gede, by it's proximity to Jakarta

5) A detailed work-plan was prepared covering the immediate data collection requirements and scheduling / activities of both Jim Cannon and Elfian through to the end of May 1998. A provisional work-plan has been prepared for the remaining period to the end of IFY 2000, dependent on the primary data collection requirements identified for LL, TI and GG (further details below).

FOLLOW ON ACTIONS AND SCHEDULE

- NRM 2 PAM to hire a research assistant in Jakarta to gather information and data (from GOI, development agencies, universities, and NGOs), document the information and data collected in database, and enter relevant numerical data into spreadsheets. A draft TOR for this post has been prepared, with the LOE expected to be full-time from March 16th to April 10th (4 weeks).

- NRM 2 PAM to hire research assistant in Palu to gather data from local government sources, Kanwil, NGOs etc. To document the information and data collected in database, enter relevant numerical data into spreadsheets, collect relevant reports/data on TI at BKSDA and NGO consortium, and collect relevant reports/data on LL at LLNP office and TNC. A draft TOR for this post has been prepared, with the LOE expected to be full-time from March 16th to May 6th (8 weeks).

- This requires coordination by NRM 2 PAM with local partners (particularly Banjar Loden and Hudi Yono, but also Agung Wibowo at TNC and Sari Sujardi at CI) to suggest potential candidates, ensure approval and local support for the research assistant, office space, and access.

- Second trip to Indonesia by Jim Cannon to take place from April 7th to May 5th (27 working days, including travel time). A full workplan for this trip has been prepared. In summary, activities include:

  1) a consultative process and draft of the technical approach
  2) a consultative process and draft of the strategy to generate interest in economic valuation at PHPA, other important GOI levels, increase the awareness of the utility of such work, and develop a training and outreach approach
  3) finalizing the draft report describing general data and information relevant to economic valuation
  4) finalizing the draft report describing currently available site specific data and information relevant to economic valuation
  5) the consultative process for finalizing a draft report of the key threats and benefits to be valued at LL, TI and GG, and, given the data and information currently available, the primary data collection requirements
  6) developing the outline work-plan (generated on this first visit) to cover the entire period through to the end of IFY 2000 in full detail.

EPIQ/NRM II TRIP REPORT

Jim Cannon (JC)

Manager of Resource Economics Program, Conservation International

RP 1.2 – Protected Area Management Component

Workplan Task/Activity: Natural Resource Economist

Dates of Work: 24th April 1998 to 25th May 1998 (26 days total)

PURPOSE of TRIP

- Continue with resource valuation work to support PHPA and develop case study sites in the Togian Islands and Lore Lindu National Park following the detailed workplan submitted to NRM2-PAM on March 16th. Principal findings and activities are reported below according to the task to which they contribute - the main bulk of the report covers the field site trips. The workplan identified seven different tasks to be completed under the current TOR, and a further eight tasks were outlined as required to complete the long term objectives. The seven immediate tasks were:

    - Task 1: Collection of reports, research papers and data in Jakarta
    - Task 2: Collection of reports, research papers and data in Palu
    - Task 3: Prepare consultative draft of the proposed technical approach
    - Task 4: Consultative meeting with PHPA to develop technical approach
    - Task 5: Assessment of existing information for sites
    - Task 6: Visit sites for stakeholder discussions, information gathering etc.
    - Task 7: Palu and Jakarta workshops to finalize research plan and data gathering

PRINCIPAL FINDINGS AND ACTIVITIES

- *Task 1: Collection of reports, research papers and data in Jakarta.* As proposed in the March 16th Workplan, a Research Assistant was hired to collect this material. The work had not yet been completed when I was in Jakarta, but was going well.

- *Task 2: Collection of reports, research papers and data in Palu.* As above, a RA was hired. Once again the work had not been completed by the time I arrived in Sulawesi. The work had not progressed as far as the data collection in Jakarta, but over 30 reports had been collected for Lore Lindu NP, and approximately 6 for the Togian Islands.

- *Task 3: Prepare consultative draft of the proposed technical approach.* As described in the March 16th Workplan, it was initially intended to arrive in Indonesia with a draft of the technical approach largely completed. This would have allowed full consultative meetings with PHPA (Task 4) prior to traveling to Sulawesi. Insufficient time was requested by NRM2, and it was decided that a shorter consultative outline would be drawn up while in Indonesia to present at the workshops towards the end of the visit. Unfortunately the political crisis prevented both the outline and the workshops taking place while in Indonesia. I worked on the outline upon return to Washington DC.

- *Task 4: Consultative meeting with PHPA to develop technical approach.* The technical approach was discussed briefly with colleagues at PHPA, but the meeting scheduled to take place at the beginning of the trip was canceled (see Task 3 above).

- *Task 5: Assessment of existing information for sites.* This was partially completed for the Togians, but could not be completed in full because the Research Assistant had not completed his TOR (Task 2).

- *Task 6: Visit sites for stakeholder discussions, information gathering etc.*

The first few days in Palu were spent meeting with the various NRM2 partners (i.e. BKSDA, Lore Lindu NP Office, Sekber, TNC) and other stakeholders / decision-makers (i.e. Provincial government offices - Pak Titus Lau - Head of Tourism, and other NGOs - the Hutan Masyarakat, Ibnu Khaldun and Kalamata) to explain the purpose of our visit and discuss our approach. During the first few days we also checked the literature and data collected by the Research Assistant and started planning our field visits. Several very useful discussions raised a number of key points and questions, namely:

- what are appropriate success measures for the proposed valuation work
- roads present a threat in Lore Lindu NP and are also a major concern in other protected areas (i.e. Murawali)
- tourism in the Togian Islands is increasing dramatically and is a real current opportunity for conservation if properly controlled
- an external social and development benefit of tourism in the Togians is improved sea transport
- there is currently no local government regulations under which additional "eco-tourism" revenues can be raised from tour operators to support protected area management
- Bappeda TK2 has proposed plantations in the Togians but land delineation has yet to be approved

During the last of these meetings and discussion, Elfian and I were joined by Pak Suwartono (from PHPA) and Ibu Emmy (from BKPA), who then traveled onto Lore Lindu NP with us.

Lore Lindu NP

While the trip to Lore Lindu NP (LLNP) was useful, the political crisis prevented Elfian and I from having sufficient consultations with local communities and stakeholders in order to fully understand the range of threats and opportunities in LLNP. In addition, some of the confusion and concerns expressed by LLNP office with respect to the general NRM2 program and aims suggest that improved communications are required. However, we did see many of the buffer zone development and management activities (i.e. butterfly farming, hotspring tourism development) and found out that numerous nature clubs based in Palu make extensive use of the park for recreation. We also had a long discussion with several rattan collectors - several important points emerged:

- today the rattan collectors penetrate up to 20kms into the park to find the most valuable rattan species (leaving only a very small central area in pristine condition)
- they will cut down trees of any size in order to collect even lower valued rattan
- their trips into the forest now include overnight stays and take 2 days
- the volume of rattan has dropped dramatically - the collectors realize that what they are doing is unsustainable and say that when it gets to difficult they will try another area
- the collectors also said they simply move to another area if enforcement became more effective in LLNP
- the collectors we spoke to claimed they did not have other ways of earning money - the majority of collectors may however be part-time

Based on these findings it is apparent that rattan collection may have a significant direct impact on biodiversity (due to tree felling and hunting for food). However, excluding the full-time collectors from LLNP may simply transfer the problem to other protected areas. Therefore the ideal solution for the full-time collectors is to find sustainable and lucrative employment for them - either in the buffer zone or elsewhere, and either in rattan collection or another activity. The solution for the part-time

collectors is probably constrained to the buffer zone where these collectors undertake their core economic activities (i.e. farming). A first key step towards prioritizing solutions would be to identify the relative volumes of rattan that are collected by full-time versus part-time collectors. Another step might be to identify whether sustainable rattan "plantations" are economically viable, and whether they will undermine the collection activities in the park or whether increased enforcement is required at the same time.

Other threats to the park come from encroachment by agriculture and increasing development pressure as a result of immigration into the buffer zone and enclaves. It is not yet clear how economic analyses might contribute to dealing with these problems, although an improved understanding of the economic incentives driving these forces would be useful.

Road development is a clear threat to the park. Economic analyses have proven to be a highly useful tool in dealing with infrastructure development threats such as roads. Road development can be a threat to protected areas all over Indonesia and it may be highly useful to develop a case study at this point.

Togian Islands

Elfian and I were joined on our fact-finding trip to the Togians by Pak Banjar Loden (head, BKSDA, Central Sulawesi), Pak Yani (Co-ordinator, Sekber) and a number of Sekber and Toloka NGO members. The trip was well planned by CI and Sekber and went extremely well. This was in part due to the close co-ordination between myself and Sari Suryadi (CI Togians Program Co-ordinator). Some confusion persists between NRM2 and CI regarding the amount of cooperation and information CI should receive from NRM2 when trying to collaborate with NRM2 activities in the Togian Islands. A clear statement regarding this issue, together with improved future communications, are required.

A good understanding of the conservation problems in the Togian Islands - and the opportunity for effective economic analysis - was developed. In addition to visiting live fish trading sites, tourism operations, pearl farms, mangrove boardwalks, reef areas, scientific research stations, and forest tourism trails, we also had three substantive village meetings with over twenty people present at each of the meetings in Wakai, Malenge and Katupat. A further shorter meeting was held with the village chief in Kabalutan.

What was evidently clear from these village meetings was that the local people have an excellent knowledge of the conservation arguments and understand the issues extremely well. This level of understanding may not extend to villages that have not been the focus of CI and YABSHI activities. However, a good knowledge of the problems and the solutions being promoted facilitates a consensus being reached among the local communities regarding appropriate land and marine uses. The immediate conservation aim in the Togian Islands is to have the area approved as a multiple-use recreation park. A consensus among the local stakeholders would greatly support this initiative.

Eco-tourism - the growth of tourism in the Togians has been impressive - in 1991 only 100 visitors were recorded (mostly "adventure" tourists), in 1995 around 1000 were recorded, while in 1997 the estimate is that 5000 tourists visited the islands (now mostly beach and dive tourism). A considerable portion of the beachfront has now been bought outright by external investors and numerous hotels have been built although most are in a modest "cottage" style. The sustainability of these investments depends on the continued attraction of the islands to tourists. Strong doubts were expressed at each of the meetings about whether tourism could really contribute enough money to support a significant number of the population. If it cannot, and no additional alternative economic activities are developed, then current economic development activities may damage the tourism attractions. If this happens then the "eco"-tourism may prove to be unsustainable.

Forestry - Pt Gobel held a concession in the Togians until 1997. There are currently no legal commercial timber operations in the islands although the majority of the forests are classified as limited production forests requiring strict selective logging management (TPTI). At the Katupat meeting it was strongly stated that the community needed a small forest area from which to take timber for construction, but otherwise they wanted all other forest areas to be protected. This was probably mainly because the illegal logging operations currently going on contribute nothing to the local villages except for providing temporary employment for some of the young men. However, the villagers were also well aware of the possible changes in water supply that might occur if the forest was damaged - the loss of substantial forest areas due to fires in Malenge is thought to be behind recent changes in the availability of fresh water.

Fires and protection - the forests of the Togians are particularly at risk from fire. They exist on porous limestone soils which dry out every dry season. Any forestry or alteration to the habitat can result in even greater drying and increased fire risk. In March this year 50 to 75% of Malenge Island forests were lost to escaped fires that were apparently originally set to smoke out bees to allow honey collection to take place. The reduced forest area and food availability has increased the frequency with which the Togian macaques enter coconut plantations and raid the trees. This has increased the conflict between the villagers and the monkeys which may result in a sharp decline in monkey population numbers.

Live fish trade - the live fish trade is a recent phenomenon. The first trader (Pak Hendrik) arrived in 1992 and set up one camp. There are now around ten collection points managed by at least two firms. He now manages the major collection point manager (in Bomba) where we visited him to discuss the history and current pattern of the trade, including the total quantity, species and individual size of fish taken. We also visited one of the collection stations (in Siatu) for PT Agro Nusa Abadi - a company based in Palu. We learned that while 7 years ago he would collect 300 Napoleon wrasse per month, he now collects less than 100. Where the fish used to be large (considerably greater than 10kg), any such fish are now extremely rare. The majority of the live fish traded are now other less valuable species (i.e. Sono). This is the classic picture of over-exploitation and unsustainable fishing development in which catches and profits continue to decrease until it is no longer worth maintaining a collection point. The trade is driven by one or two companies exporting the fish, predominantly to Hong Kong. Large vessels arrive direct from Hong Kong once or twice a month. The local villagers have a good understanding of the threat that destructive fishing practices present to their long term fish catches. Unfortunately they did not know of any customary marine tenure laws that entitled them to protect an area. However, as the villagers pointed out on numerous occasions, even if they were entitled to protect an area, they had no way of controlling access to any but the closest reefs. These closeby reefs were generally in poorer condition than reefs further offshore which had not been subject to the same degree of pressure.

Pearl farming - the extent to which pearl farms can expand in the Togians is apparently limited by the availability of suitable sites. While the conservation impact of pearl farms is apparently small (though I would like confirmation regarding turtle kills, and that they do not use of chemicals to clean the oysters and pesticides or drugs to treat diseases), they occupy large areas of sea to which local fishermen are denied access - either to cross or to fish. This obviously creates social unrest, particularly because the pearl farms rarely paid local communities for the sites.

** ***Based on the above discussion***, I believe that the following economic analysis could be useful:

- the economics of logging versus water supply security could be useful in persuading the forestry department to reclassify the Togian forests as - at a minimum - watershed protection forest. Note that any forestry increases the risk of fire - dramatically so in the Togians because the limestone soils means the forests dry out in every dry season. Also note that logging has been the precursor to conversion for coconut plantations.

- the economic case for further forest protection could be made based on their value for tourism. Not only do the forests represent an additional activity that may attract more tourists and persuade them to stay longer (increased "destination activities diversity"), but the forests are also needed to minimize siltation impacts on the coral reefs
- it is essential to quantify the potential contribution that eco-tourism can make to the local community. If tourism cannot, on its own, bring in enough money to persuade local people it is better to invest in conservation than damaging activities (i.e. cyanide fishing) then eco-tourism will not be sustainable in isolation. An economic analysis at this stage would help guide future protected area management investments.
- an improved understanding of the incentives that attract fishermen to cyanide or dynamite fishing, and the potential of alternative fishing methods in the live fish trade. If it is clear that cyanide fishing is considerably more profitable than we must ask - how can this be enforced, and can the economic cost be justified? Such enforcement may be economically justified because a healthy reef will contribute to tourism revenues and will also help sustain catches for local consumption.

These options need to be presented at a workshop at which the major stakeholders are present. The aim is to carry out a select number of analyses that provide sufficient information to persuade stakeholders and decision-makers that investing in protection is the best development option. Once consensus has been reached regarding the topics to be researched, the available data can be assessed and the primary data collection program defined.

- *Task 7: Palu and Jakarta workshops to finalize research plan and data gathering.* Postponed. We returned from our field trip on Thursday 14th May. Initial workshop arrangements were started on Friday morning and then abandoned as the political crisis worsened. I continued to prepare material for these consultative workshops upon returning to Washington DC.

- *Extra task - Bunaken valuation* - A further task was added in the second approved TOR: to prepare and present in Manado a workshop on NRMP valuation activities on Bunaken NP. A further 6 days were apparently approved (I am still waiting for confirmation on this) to support this activity, but the political crisis intervened and the workshop was postponed.

- *MISCELLANEOUS* - As outlined in the workplan, the possibility of carrying out valuation work in Gunung Gede Pangrango will be explored on a future trip (details in Tasks 9 and 10 of the March 16th Work Plan). On a public holiday (Tuesday 28th April) I took the opportunity, while visiting Gunung Gede Pangrango NP, to talk with the Park Director. He expressed great interest in the valuation concept and described how such information would be useful in maintaining funds for the park and helping attempts to include forest areas currently outside the park. He pointed out several economic studies had already been done, and that economic data on visitors was being collected. This initial contact was encouraging and suggests that sufficient data may exist to carry out a relatively complete economic valuation and that the results could be directly useful to the park. As noted in my previous trip report, Gunung Gede is easily accessible for Jakarta based decision makers and is thus useful in demonstrating to these decision makers the potential for economic valuation in aiding decisions regarding protected areas.

CONCLUSIONS AND RECOMMENDATIONS

1) Strong progress in scoping the valuation research was made in the field and the beginnings of productive professional relationships were established between myself and Elfian, and between us and our partners in Sulawesi and PHPA. It is imperative that this momentum is maintained so that the future work plan can be agreed and primary data collection can be started.

2) In order to complete the current TOR I believe a further trip to Indonesia is required as soon as possible. The current status of the deliverables is discussed immediately below, while the proposed trip is discussed further in the following section.

3) The deliverables specified in the March 16th workplan were as specified in the first approved TOR:

- Output 1: A description and assessment of available data
- Output 2: An outline of the economic valuation approach and manual
- Output 3: A work plan for IFY98-99 and IFY99-00

A further output was subsequently added - to prepare and present a workshop in Manado on the results of the Bunaken NP valuation work carried out by NRMP. Due to a shortfall of 16 days[1] (not including travel) between time requested and the time actually available, not all tasks could be completed (see Principal Findings section above) and these outputs could not be achieved in full. At the current time the status of the deliverables are as follows:

- Outline of valuation approach - draft complete
- Outline of valuation strategy - draft partially complete
- Work plan to IFY 2000 - draft partially complete
- Data description and assessment report - not complete

As noted above, I believe a further trip to Indonesia is required as soon as possible in order to complete these deliverables.

4) It is essential that a sufficient part of Elfian's time be allocated to resource valuation work[2]. This time is required to allow Elfian to collaborate fully with PHPA and other NRM2 partners, to manage the data collection process and to carry out economic analyses.

5) It would also be helpful if I had sufficient time in Washington DC[3] to allow me to monitor progress and contribute effectively to ongoing work in Sulawesi and Jakarta in between trips to Indonesia.

6) It is strongly recommended that the long term research assistants that will collect the required primary data in both the Togian Islands and Lore Lindu NP are selected in collaboration with the various NGOs active in each site. Clearly the selection decision will ultimately be made by NRM2, but any assistance from local NGOs and NRM2 partners should be acknowledged and they should, at a minimum, be informed about the candidate(s) who was selected. In general, a clearer statement of the relationship between NRM2 and its partners would be helpful and should lead to improved collaboration and communication. It is these partners who will maintain a long term future presence in Indonesia at the field level and have invested the most time and effort to date.

FOLLOW ON ACTIONS AND SCHEDULE

- *A further trip to Indonesia* should be scheduled for me as soon as possible after the Research Assistants have completed their TORs in order to:

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[1] comprising of an 8 day shortfall between the time requested in the March 16th workplan and the time actually approved , the 6 missed days for the Bunaken preparation, and the 2 days spent arranging my exit from Indonesia during the crisis

[2] note that if Elfian spends 2 months fulltime with me while I am in Indonesia, then an additional 2 months would be required in order to allow him 4 days per month to pursue valuation work throughout the rest of the year.

[3] say an average of 1.5 days per month through to September 1999.

(1) complete the assessment of issues in Lore Lindu National Park
(2) hold the consultative workshops to select the issues for analysis in both Lore Lindu and the Togian Islands
(3) finalize the data assessment report
(4) finalize drafts of the technical approach and strategy for review
(5) finalize the work plan (including primary data collection) through to September 1999.

EPIQ/NRM II TRIP REPORT

Jim Cannon (JC)

Manager of Resource Economics Program, Conservation International

RP 4.2 – Policy and Planning

Workplan Task/Activity: Natural Resource Economist

Dates of Work: 7th September 1998 to 30th September 1998
(21 days in Indonesia + 4 international travel days = 25 days total)

PURPOSE of TRIP

The purpose of the trip was to carry out a participatory workshop in Palu on using economic valuation to guide development and land use planning, with the Togean Islands as a case study. The workshop had three stated aims:

1. determine economic values and make recommendations for development in the Togean Islands

2. where economic values cannot be determined or a consensus on decisions could not be reached, then make recommendations for further work required for the Togean Islands

3. evaluate how useful the proposed valuation approach is in general, and make recommendations for improvements

The long-term aim of the work being carried out here is to develop a valuation approach with the following requirements:

- provides decision makers (in this case from Bappeda and BKSDA) with enough information of adequate quality to guide land use and development decisions
- will be used widely across Indonesia

In order to achieve the first requirement, decision-makers must view the figures produced as credible. For the figures to be credible it is suggested that the valuation methods used need to:

1. be simple, so they can be understood
2. be based on data perceived as accurate
3. use assumptions perceived to be reasonable

If valuation is to be used widely across Indonesia, then - in addition to producing credible information - the methods must also be:

4. rapid, so that information can be made available to decision makers when they need it
5. applied by staff of Indonesian Government departments and organizations
6. inexpensive

These requirements mean that the valuation approach should use currently available data as much as possible to reduce the expense of data collection. The data currently available is generally market based and describes either the production use of natural resources (i.e., fish catching, farming, forest products harvesting) or non-production uses (i.e. tourist visitor numbers and expenditure). Decision makers may also be more familiar and comfortable with this data than the information collected by the survey based

methods required by contingent valuation. The methods required to use market based data are considerably more simple than the statistical analyses required to interpret contingent valuation surveys. This simplicity means they can be understood by decision-makers, can be done reasonably quickly, and can be more readily applied by a greater number of staff in Indonesian Government departments and organizations.

Given the above points, it appears that a valuation approach using simple methods to analyze available market based data may be most suitable. However, the major drawback of such an approach is that it can only capture part of the total economic costs of impacts on the environment. The approach cannot determine bequest or existence values, nor can it determine values if market based data does not exist. Therefore the figures determined using such an approach represent a minimum lower bound on the actual total economic value.

However, knowledge of only part of the total economic value may be sufficient to guide development decisions. This can be true where products or services based on natural habitats have a high market based value (i.e. eco-tourism, fresh water supply or fisheries) and the profits of the proposed development activity are low. In these cases, valuing the impacts of the development activity using only a few of the attributes of a natural habitat may result in costs that are greater than the profits of the proposed development activity. Hence it is not necessary to try and determine the economic value of further environmental impacts because the project can already be rejected on the basis of current information.

In most cases it will not be known in advance whether the market based natural habitat values that can be determined using currently available data will be greater than the value of proposed development activities. An analysis using currently available data is the first step in an iterative process. If the values based on currently available data are not sufficient, then additional data can be collected and further analyses carried out.

The valuation analyses are best carried out in a participatory nature in order to:

- utilize the data and knowledge of NRM 2's Indonesian partners and counterparts as fully as possible
- maximize the involvement and feedback from partners and counterparts to develop an appropriate resource valuation approach
- raise awareness among all participants, but chiefly Bappeda and BKSDA, of:
  - the need for economic valuation of resource use
  - the kind of information that valuation can provide
  - the way in which valuation can be carried out

The workshop was a continuation of the activities carried out under two previous trips to Indonesia under the NRM2 protected areas management component RP 1.2.

PRINCIPAL FINDINGS AND ACTIVITIES

Activities

- *Task 1: Arranging the workshop.* The Katua Bappeda TK1 was asked, and subsequently agreed, that Bappeda would formally host the workshop, arrange moderators and stenographers, and send out invitations. An invitation list and agenda was developed in collaboration with Bappeda TK1, BKSDA and Sekber Konsorsium Togeans. The workshop was held at the Palu Golden Hotel. The workshop arrangements went smoothly, due principally to the efforts of Pak Sofyan (Bappeda TK1), the Sekber Konsorsium Togeans staff and Pak Mirza (NRM 2 Provincial Liaison Officer).

- *Task 2: Analyze available information.* Information and data were extracted from: (1) the reports and material collected by NRM 2 PAM research assistants in Palu and Jakarta earlier in 1998; (2) from

material collected by the consultant and Pak Elfian on an earlier visit to the Togean Islands, and (3) from the consultants own collection of valuation literature. The problems with currently available data are: (1) small quantity; (2) poor quality; (3) inappropriate spatial scale; (4) no time series. The analyses carried out, the development decisions that could be reached, and the implications of data availability for further work in the Togeans and valuation work in general are discussed further below.

- Task 3: Preliminary meetings, and the workshop

  Over the week preceding the workshop, preliminary meetings were held with Konsorsium Togeans, BKSDA, Bappeda, and the Kanwil and Dinas departments of tourism, fisheries and forestry based in Palu. The one-day workshop was held on the 23rd September, with 54 participants from both Palu and Poso in attendance.

- Task 4: Follow up meetings, workshop report, and future workplan

  Immediate follow-up meetings were held with Bappeda, BKSDA, Konsorsium Togeans, BLLNP and TNC/YPAN. These meetings discussed the actions that could be taken in light of the workshop recommendations for the Togeans (Section A below), and the further work required (Section C below). Improvements in the valuation approach were also discussed (Section B below). A workshop report is being prepared and will be used in discussions with BKSDA, Bappeda and Konsorsium Togeans to fully develop a future workplan.

- Task 5: Present findings and discuss future workplan in Jakarta

  Findings were presented at PHPA in Jakarta. The future workplan was briefly discussed in further detail with Sari at CI and Tim Brown at NRM2.

Findings

- *Analyses of existing data.*

  Sufficient data was found to prepare reasonable assessments of the profitability of forestry and tourism on the Togeans. No data could be found on the reef fisheries (government data was solely for the offshore fisheries in Tomini Bay). The Togeans based field staff of Konsorsium Togeans carried out surveys of fishing for a few households immediately prior to the workshop. This information, together with the expert opinion of the field staff, was used to estimate fisheries production and value. Opinions were also solicited regarding the use and availability of freshwater on the Togeans.

  No impact assessment data exists for activities on the Togean Islands. Information from studies in other areas was used to guide assumptions.

  In order to allow for the great uncertainty (resulting from lack of data), alternative scenarios (low, medium and high value) were prepared for each activity. The comparison of forestry with conservation was made using the high profit scenario for forestry, and the low value estimates for tourism, fisheries and freshwater supply. Even with this apparently cautious approach it was clear that the value of the natural habitat for fisheries, tourism and water supply exceeded the profits of forestry.

CONCLUSIONS AND RECOMMENDATIONS

The results of the participatory valuation workshop were encouraging in many ways:

1. Firstly, the suggestions to ban logging that were voiced at the workshop (see section A below) suggest that decision-makers are reasonably comfortable with the concept of sufficient information and will take certain decisions based on the results from rapid valuation methods (but see point 3).
2. The participatory nature of the workshop worked very well in drawing out existing data and information from experts from local Government and other organizations. Hence the critical shortfalls in data availability and quality became clear and the necessary future work on data collection and research could be clearly identified (see section C below).
3. The participatory workshop was also very successful at gaining feedback on developing and improving the valuation approach. Comments and suggestions were received on the need to: consult/involve local communities; reduce the number of assumptions made in the valuation analyses; clarify the context in which economic information is used (see section B below for details). It should be noted that these opinions were not ventured in the one-on-one discussions with workshop participants prior to the workshop, nor on the previous trips in February or May. I believe this is because the participants did not feel confident enough to provide constructive criticism of the valuation approach until they worked through an actual example.

Workshop conclusions and recommendations are reported below for each of the workshops stated objectives. Full details of the analyses presented at the workshop, the feedback from participants on these analyses and the approach in general, and conclusions and recommendations are provided in the Workshop Report.

A: The main workshop recommendations for development in the Togeans were:

1. There should be no further logging on the Togean Islands. In follow up discussions with BKSDA and Sekber Konsorsium Togeans the following points were made:

   1.1 Kanwil Kehutanan stated at the workshop that they did not intend to issue any new concessions for forestry in the Togeans. This means that the following zonations should not be used: HPH, HPTI, and IFK. Ideally all forest outside the APL zone should be zoned by Kanwil Kehutanan as HL (as a minimum requirement – higher levels of conservation protection may be possible and necessary). Kanwil Kehutanan may issue a formal letter to this effect and BKSDA, Sekber Konsorsium Togeans and Bappeda should monitor the situation.

   1.2 The majority of the land on the Togeans has recently been designated as APL. Responsibility for permitting commercial forestry operations in these areas falls to Dinas Kehutanan. The Dinas Kehutanan is apparently preparing a concept letter that states that it will not issue any IPKTM licenses in the APL zone on the Togeans. It should be confirmed that this does not preclude community forestry to supply own needs. BKSDA, Sekber Konsorsium Togeans and Bappeda should seek verification that this letter is being prepared, or has been issued. BKSDA may write a letter recommending this to Dinas Kehutanan.

   1.3 Furthermore, BKSDA, Sekber Konsorsium Togeans and Bappeda should co-ordinate to make the case to Dinas Kehutanan for protection of the following: (1) mangrove forests and coastal forest (to prevent sedimentation on the coral reef); (2) forest areas critical to protect the quantity and quality of fresh water supply, such as forest around springs (to prevent runoff entering the drinking supply) and on steep slopes (to minimize runoff and allow rainfall to enter the water-table).

2. BPN, the state office responsible for giving licenses for agricultural land use in HK and APL zones, were invited but did not attend the workshop. They should be informed of the workshop findings and recommendations (namely, the value of forest for water supply, and for tourism and fisheries by protecting coral reefs from sedimentation). Konsorsium Togeans and / or BKSDA / Bappeda TK1 may also write a letter to the Governor asking that no licenses should be issued by BPN in HK or APL zones without further economic valuation and community consultation.

3. There are currently two Governor decrees for the Togean Islands: (1) Toman Wisata Alam; and (2) Paduserasi. The Paduserasi decree came later and has precedence, but it has no Toman Wisata Laut shown. BKSDA, Sekber Konsorsium Togeans and Bappeda should co-ordinate to request that this contradiction is resolved, and to suggest that economic valuation can help. The request could be framed as a study seeking to identify areas for conservation in the Togean Islands (rather than simply seeking Toman Wisata Alam). As part of this process, Bappeda TK1 could write to Bappeda TK2 saying that the spatial plan should use economic valuation to take account of environmental impacts and demonstrate the value of conservation. This suggestion fits in with comments from spatial planners in Bappeda TK1 that economic valuation would be a useful tool in demonstrating why rational spatial planning is required in Indonesia in general.

4. The partial results obtained from this workshop suggest that conservation may be the best development investment for local communities and the general economy in many areas of Central Sulawesi.

B: The following improvements were recommended for the valuation approach in general:

Context

Considerable care should be used in describing how the resource valuation approach and the use of its results can fit into the decision-making process. While participants were generally receptive to the need for economic valuation, there was considerable concern over exactly how the information could be used to make development decisions. This concern appears to be due to current uncertainty regarding the role of different stakeholders in the decision making process (i.e. Togean communities and/or Central, Provincial and District Government) and how a consensus among these various stakeholders can be reached.

Recommendation: It is obviously beyond the power of a resource valuation workshop to decide the appropriate political process to be used in reaching development decisions. While an example of how valuation could form part of the decision making process is provided below (based on comments received from workshop participants), the following steps are recommended:

- In future valuation studies, it should be emphasized early on in the proceedings that the results of economic valuation would be useful to all decision-makers and stakeholders. Considerable time may be required to deal with this point, and it may be appropriate to have a separate seminar in advance of the valuation workshop.
- As a minimum requirement, the results of the economic valuations should be made available to all relevant decision-makers and stakeholders from the community level up to central government.

Concepts

The general concept of economic valuation was well understood (i.e. placing values on environmental and ecological impacts in order that these impacts are given due importance in development decisions). However, the key concept of the proposed valuation approach (that values for all impacts may not be required before a decision can be made) was new to many of the workshop participants.

Recommendation: Considerable time and effort (and case studies?) may be required to familiarize decision makers with the idea that valuing only a few of the impacts may provide enough information to guide decisions.

- A separate seminar is required to familiarize decision-makers with the more subtle concepts of rapid valuation. This familiarization seminar would ideally be held considerably in advance of discussing the results of economic valuation work so that any questions can be dealt with prior to the workshop.

Separate presentation of results to senior decision makers from participatory valuation exercise

There was a general feeling that the workshop tried to do too many things too quickly. More time was needed to go through the analyses with local technical experts, but this should not be combined with presentation of the results to senior decision-makers and other stakeholders.

Recommendation: that technical focus groups should be set up to prepare the various components of the valuation exercise (i.e. forestry, ecotourism, fisheries, agriculture, NTFPs, biodiversity). These different focus groups could then meet at a participatory valuation workshop to combine their results. A presentation based on their findings could then be made to decision-makers and stakeholders.

Community involvement

The was concern that local communities should be more involved in the valuation work, and that some thought was needed regarding the way in which local communities could be brought into the decision making process (see *Context* above). There was also concern that the current knowledge of community livelihoods and the role of natural habitats were poorly understood, and that better data was required.

Recommendation: Communities need to be consulted and involved more. The data and information gathering needed to improve understanding of community livelihoods may represent an opportunity to involve communities.

Level of precision

There was some discomfort expressed regarding the number of assumptions required to carry out the valuation exercise given the poor data availability and quality. Bappeda expressed an interest in using valuation results to demonstrate the advantages of rational spatial planning and therefore gain support for their work. This use of the valuation results may require considerable accuracy so government departments which stand to lose political power (i.e. District level forestry departments) cannot find significant fault with analyses. A similar situation may exist for BKSDA, both when they are seeking to get new protected areas established and when they are looking for increased funding.

Recommendation: The main assumptions were made in two areas: (1) community livelihoods and use of natural resources; and (2) physical changes and impacts resulting from development activities (i.e. forestry). Reducing the need for assumptions regarding the strength of impacts could require considerable scientific research time and expense – both of which would prevent the valuation approach from being widely, used. Given that communities need to be more fully involved, the opportunity exists to do this while simultaneously removing assumptions regarding community resource use.

Coordination between Government departments

The workshop brought together participants from NGOs and Government departments of agriculture, forestry, fisheries, tourism, conservation, environmental impact assessment and spatial planning. As a result of the participatory sessions, each department improved its understanding of the others' activities, plans and concerns. This was thought to be a useful step in rationalizing development planning, and several participants requested that co-ordination between departments needed to be improved.

Need for economic analyses of incentives, not just value

While the utility of the valuation results was accepted, there was also interest in using economic analyses to help design resource use policies, regulations and management plans. Economic analysis can help in determining the incentives of different stakeholders. This information can be used to identify the most cost effective policies and regulations that achieve management objectives.

Overall recommendations to improve valuation approach

In light of the comments and recommendations above, the following is proposed:

Step 1: Preliminary presentations to decision-makers and stakeholders to explain the context and concept of resource valuation. Separate presentations may be made to: (a) senior decision-makers; (b) local technical experts; (c) community leaders and stakeholders.

Step 2: Collection of community data to feed into technical focus groups and help involve local communities in valuation process.

Step 3: Technical focus groups are formed which gather necessary data and information and assess: (a) the profits of their activity; (b) the environmental conditions required by their activity, and how the profits of their activity may alter in response to changes in these conditions; (c) the physical changes (impacts) that result from their activity; and (d) the distribution of the profits of their activity, and how this distribution might need to be altered. Technical focus groups may include representatives from the relative government department and business sector, as well as NGOs and local communities.

Step 4: Carry out a technical participatory valuation workshop for the technical focus groups. The assessments made in step 2 can be combined to determine the economic costs of the impacts of different activities as measured by changes in productivity or earnings in the other activities. Such a valuation workshop would also help coordination between Government departments.

Step 5: The results of the participatory valuation workshop can then be presented to: (1) senior decision-makers; (2) local technical experts; (3) community leaders and stakeholders. Local experts who took part in the focus groups would preferably present the results.

Step 6: The data and information gathered as part of the valuation exercise is used to assess stakeholder incentives and design cost effective management policies and regulations that will deliver the desired land and resource use.

C: The following further work was recommended for the Togeans:

Activities similar to the six steps described above are required in the Togean Islands. Sekber Konsorsium Togeans has a community data gathering exercise under way and there is scope for confusion on the behalf of the local communities if another data collection exercise is implemented. Discussions are under way with the Konsorsium to determine the most appropriate way of collecting the necessary community livelihood data and information. The participatory workshop that has already been carried out represents a significant contribution to Steps 1, 2, 3, 4 and 5.

FOLLOW ON ACTIONS AND SCHEDULE

The conclusions and recommendations above translate into the following suggested future actions and schedule for the Togean Islands:

Togean Islands: The first action is to carry on discussions with Konsorsium Togeans and local communities regarding the most appropriate method to gather data from Togean communities. Once the data collection process has been determined, initiate discussions to form the technical focus groups and start on steps 2 through 6. It is anticipated that an appropriate data collection process can be identified by the end of January 1999. The most likely data collection process will involve some type of socio-economic survey. The time required for data collection will depend on the process adopted. Once the necessary data has been collected it is proposed to carry out Steps 3, 4 and 5 over a period of six weeks, with further trips to carry out step 6 to be determined.

DAFTAR PARTISIPAN YANG DIUNDANG DAN YANG HADIR
PADA ACARA WORKSHOP PENILAIAN EKONOMI SUMBER DAYA ALAM KEPULAUAN TOGEAN
HARI RABU TANGGAL 23 SEPTEMBER 1998 DI PALU GOLDEN HOTEL - SULAWESI TENGAH

No.	INSTANSI	NAMA YANG DIUNDANG	NAMA YANG HADIR
1	Ketua Bappeda Tk. I Propinsi Sulawesi Tengah	Ir. Yahya Ponulele, SE	Ir. Yahya Ponulele, SE
2	Kepala Bidang I Bappeda Sulteng (Penelitian)	Drs. Rais Lamangkona, MT	Drs. Rais Lamangkona, MT
3	Kepala Bidang II Bappeda Sulteng (Ekonomi/Keuangan)	Ir. Rauf Toramay	Ir. Rauf Toramay
4	Kepala Bidang III Bappeda Sulteng (Sosial dan Budaya)	Drs. Zakaria Kamidong	Drs. Zakaria Kamidong
5	Kepala Bidang IV Bappeda Sulteng (Fisik & Prasarana)	Dra. Uhra AR Kadir	Dra. Uhra AR Kadir
6	Kepala Bidang V Bappeda Sulteng (Statistik & Pelaporan)	Drs. Firman Mannua	
7	Ketua Bappeda Tk. II Kabupaten Poso		Drs. J. Tadanugi
8	Sekwilda Tk. II Kabupaten Poso	Yahya Pattiro, SH	
9	Kepala BPN Tk. I Propinsi Sulawesi Tengah	Drs. Andi Palesangi, SH	Sarinu
10	Kepala BPN Tk. II Kabupaten Poso		
11	Kepala Kantor Wilayah Dephutbun Propinsi Sulawesi Tengah	Ir. Riwung Toemon	
12	Kepala Bidang Pengukuhan Hutan dan Konservasi Alam	Ir. Idris Makkanyuma	Ir. Idris Makkanyuma
13	Kepala Bidang Pengusahaan Hutan Kanwil Dephutbun	Ir. Udin Subagiyono	
14	Kepala Dinas Kehutanan Tk. I Propinsi Sulawesi Tengah	Ir. Kasman	Alexander Rumambi
15	Kepala Balai Konservasi dan Sumberdaya Alam VI (Sulawesi)	Ir. Banjar Yulianto Laban, MM	Ir. Banjar Yulianto Laban, MM
16	Kepala Balai Taman Nasional Lore Lindu	Ir. MZ. Hudiyono	Ir. MZ. Hudiyono
17	Balai Taman Nasional Lore Lindu		Ir. Helmi
18	Kepala Sub BKSDA Propinsi Sulawesi Tengah	Ir. Eddy Purwanto	
19	Kepala Cabang Dinas Kehutanan Tk. II Kabupaten Poso	Ir. Elisa Bunga'allo	J. Siahaan
20	Kepala Dinas Perhutanan dan Konservasi Tanah Tk. II Poso	Ir. Nanardi	Ir. Nahardi
21	Kepala Dinas Perkebunan Tk. I Propinsi Sulawesi Tengah	Ir. Ny. Bantilan	Ir. Suddin, MP
22	Kepala Dinas Perkebunan Tk. II Kabupaten Poso		
23	Kepala Sub Balai Inventarisasi dan Pemetaan Hutan Palu		Ir. Midian Silalahi
24	Kepala Kantor Wilayah Dept. Pariwisata, Seni dan Budaya	H. Said Siregar, SH	J. Hahawan
25	Kantor Wilayah Dept. Pariwisata, Seni dan Budaya		Arfan Sirajudin
26	Kepala Dinas Pariwisata Tk. I Propinsi Sulawesi Tengah	Titus La'u, BA	Titus La'u, BA
27	Dinas Pariwisata Tk. I Propinsi Sulawesi Tengah		Hatika
28	Dinas Pariwisata Tk. I Propinsi Sulawesi Tengah		Anshar Laula
29	Kepala Dinas Pariwisata Tk. II Kabupaten Poso	Drs. Yutni Bungkundapu	Suryabadjadji
30	Kepala Sub Dinas Obyek Wisata		
31	Kepala Dinas Pertanian Tanaman Pangan Tk. I Sulteng		Thamrin
32	Kepala Dinas Perikanan Tk. I Propinsi Sulawesi Tengah	Ir. Faisal Sahab	Yahya Wattimena
33	Dinas Perikanan Tk. I Propinsi Sulawesi Tengah		Agung Kastono
34	Kepala Dinas Perikanan Tk. II Kabupaten Poso		
35	Kepala Bapedalda Sulawesi Tengah	Drs. Said Awad	Amir Pettalolo
36	Kepala Biro Pusat Statistik Tk. II Kabupaten Poso		
37	Bupati Kepala Daerah Tk. II Kabupaten Poso	Arif Patanga, SH	
38	Camat Kepala Wilayah Kecamatan Walea	Drs. Moh. Nasrun	
39	Camat Kepala Wilayah Kecamatan Una-una	Moh. Arief Latjuba, SE	
40	Kepala Depdikbud Kabupaten Poso	Drs. Bahrun Latjuba	

No.	INSTANSI	NAMA YANG DIUNDANG	NAMA YANG HADIR
41	TNC / YPAN Palu Field Office	Ir. Agung Wibowo	Ir. Agung Wibowo
42	Konsultan NRM2 untuk Balai Taman Nasional Lore Lindu	DR. Arthur Mitchell	DR. Arthur Mitchell
43	Eksekutif Direktur WALHI Sulawesi Tengah	Ir. Aristan	Harley
44	Yayasan Toloka	Drs. Mahmud Da'l	Drs. Mahmud Da'l
45	Yayasan Evergreen Indonesia		Rasdi Wangsa
46	LPSL		Ir. Harianto
47	Wartawan Harian Mercusuar		Basri Marzuki
48	Penterjemah		Suyadi
49	Pembantu Gubernur wilayah Timur di Poso	Drs. Tubondo	
50	Direktur Bina Konservasi Sumberdaya Alam Dirjen PHPA Jakarta		
51	Pusat Studi Lingkungan Universitas Tadulako	Ir. Muh. Hamid Noor, MS	
52	Bappeda Tk. I Sulawesi Tengah (Panitia Pelaksana)	Drs. Taswin Pidu	Drs. Taswin Pidu
53	Bappeda Tk. I Sulawesi Tengah (Panitia Pelaksana)	Ir. Saleh Gunawan	Ir. Saleh Gunawan
54	Bappeda Tk. I Sulawesi Tengah (Panitia Pelaksana)	Ir. Faisal Pangale	Ir. Faisal Pangale
55	Bappeda Tk. I Sulawesi Tengah (Panitia Pelaksana)	Joni, ST	Joni, ST
56	Bappeda Tk. I Sulawesi Tengah (Panitia Pelaksana)	Ir. Muslih, MS	Ir. Muslih, MS
57	Bappeda Tk. I Sulawesi Tengah (Panitia Pelaksana)	Musdalifah, Spi.	Musdalifah, Spi.
58	Bappeda Tk. I Sulawesi Tengah (Panitia Pelaksana)	Drs. Syarifudin	Drs. Syarifudin
59	Bappeda Tk. I Sulawesi Tengah (Panitia Pelaksana)	Ir. Maya M. Noor	Ir. Maya M. Noor
60	Bappeda Tk. I Sulawesi Tengah (Panitia Pelaksana)	Ir. Syofyan T. Rukama	Ir. Syofyan T. Rukama
61	Sekber Togean	Ir. Yani S. Permana	Ir. Yani S. Permana
62	Sekber Togean	Rakhmawati Ottulawa, SSos.	Rakhmawati Ottulawa, SSos.
63	Sekber Togean	Kherul Anwar, Ssi	Kherul Anwar, Ssi
64	Sekber Togean	Abdurrasyid Languha	Abdurrasyid Languha
65	Sekber Togean	Fandi Musa	Fandi Musa
66	Sekber Togean	Yandri Iwan	Yandri Iwan
67	YABSHI	Christoverus Hutabarat, SSi	Christoverus Hutabarat, SSi
68	Conservation Indonesia Indonesia Program (CIIP)	Dra. Sari Suryadi, MSc	Dra. Sari Suryadi, MSc
69	Conservation Indonesia (CI)		Wendi Tan
70	NRM2 - CI	Jim Cannon, Phd	Jim Cannon, Phd
71	NRM2 (PLS-CS)	Ir. Mirza Indra	Ir. Mirza Indra